

# AMAZALERT Delivery Report

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## **INTRODUCTION**

This Deliverable has a somewhat different content than originally envisioned, reflecting changes in the work that was executed. The original proposal, as documented in the Description of Work, assumed that the stakeholder engagement process would entirely be through a series of (three) workshops in Brazil to develop socioeconomic and land use scenarios in close collaboration with SHS. During initial discussions, it became clear that by making use of an ongoing scenario-development process in Brazil, other options would become available to expand the stakeholder interaction process. We decided to add two stakeholder-engagement activities within AMAZALERT, namely a scenario workshop in Europe and a number of interviews with additional stakeholders in Brazil to enlarge the geographic coverage of our pool of stakeholders. This Deliverable therefore consists of three main parts.

Part I: Stakeholder workshops in Brazil. This part contains the methods and main results obtained from two workshops organised in Brazil (Belem and Brasilia).

Part II: Stakeholder workshop in Europe. This part contains the methods and main results obtained from a workshop organised in Belgium (Brussels).

Part III: Stakeholder interviews in Brazil. This part contains methods and results obtained from interviews with Amazon-wide interviews.

The concluding section will shortly highlight some of the differences and commonalities.

## **PART I – STAKEHOLDER WORKSHOPS IN BRAZIL**

### **I.1. Introduction**

The approach adopted for the construction of scenarios of land use in AMAZALERT is the use of participatory methods, combining qualitative and quantitative elements<sup>1</sup>. Stories about future alternatives with representatives from different sectors of society will be quantified by computational models capable of generating explicit spatially representations of land use in the region in coming decades. Society participation in this process is essential so that the scenarios reflect multiple perspectives on the future. Furthermore, we hope that the process of scenarios discussing can itself, to some extent, contribute to the region's future - providing a space for joint reflection on actions needed to achieve a sustainable future.

This part summarises the qualitative results of two AMAZALERT Scenario Participatory Workshops. The first workshop was held on June 24, 25 and 26 in Belem, State of Para, and aimed to discuss alternative scenarios for the future of the Brazilian Amazon in 2050 with representatives of civil society and the stakeholders. The focus of the first workshop was the discussion of what would be a common future with high social and environmental development (SUSTAINABILITY), as opposed to a low social and environmental development (FRAGMENTATION). Such scenarios represent plausible opposing based on current trends of the dynamics of land use in the region. As illustrated in Figure 1, these scenarios are aligned with the SSP 1 and 3 of the AR5, as well as scenarios for Brazil under discussion at the Center of Earth Science (INPE), based on the same axes (Social and Environmental Development). In AMAZALERT, the 'Middle' scenario will also be quantified using computational models, combining elements of the most extreme scenarios.

The second workshop was held in Brasilia on November 25, 2013, including representatives from research and governmental organizations, and representatives from the 1st workshop. The 2nd workshop aimed to discuss the trajectories and actions needed to achieve the desired future outlined on the 1st workshop, focusing on public policy. For the workshops scenarios in the project, we had the collaboration of partner institutions headquartered in the Amazon, especially the Emilio Goeldi Museum of Para and IDESP, Para. The organization and conduct of workshops were the responsibility of EMBRAPA Satellite Monitoring and INPE.

This part will be distributed to the participants of the two workshops. Based on received comments, final document will be combination of elaborated qualitative and quantitative results.

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<sup>1</sup> There are different types of scenarios and approaches used for different purposes. See Aguiar et al. (2014) for a review of scenarios in which you can understand where lies the approach adopted in AMAZALERT

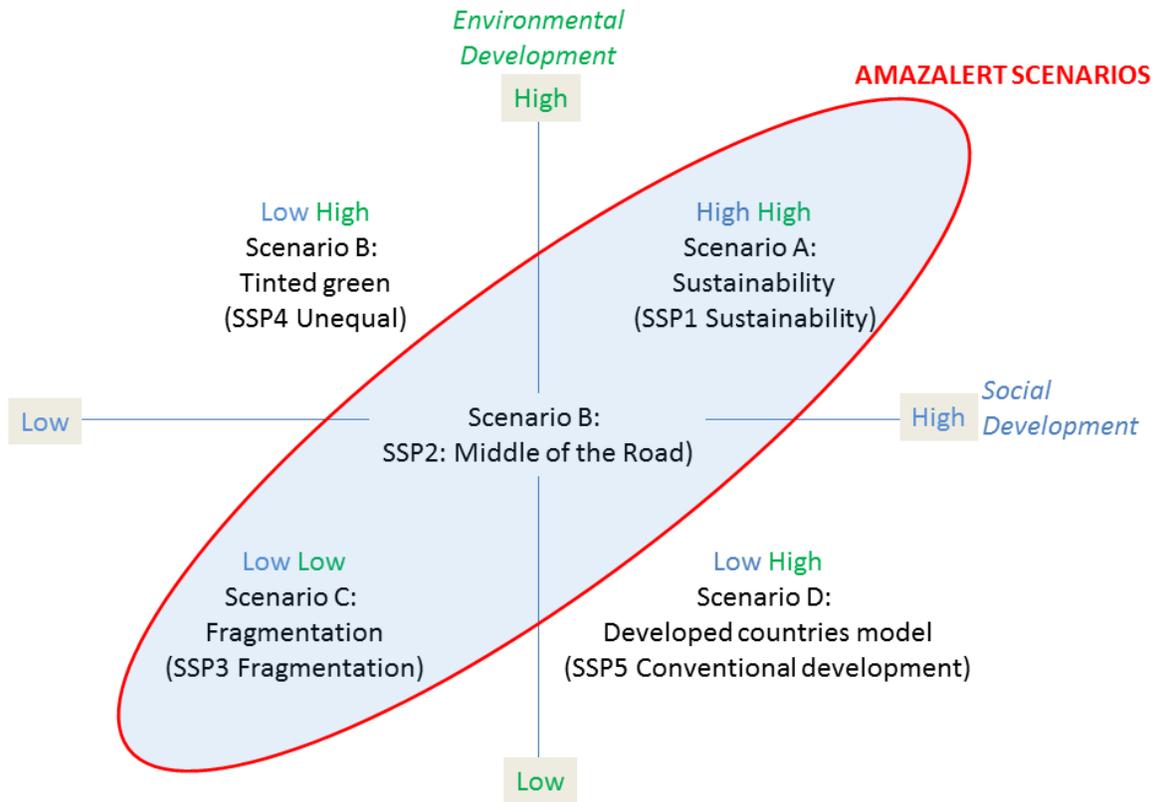


Figure 1: Representation of AMAZALERT scenarios of land use in the context of the axes defined by the scenarios of the CCST, aligned to the SSP, AR5.

**"The present": current situation and trends.**

**"The Future": vision of the desired future and unwanted by the year 2050.**

**"The Pathway": evolution of the current situation for the two opposites, with emphasis on the path to the desired future: what actions are necessary?**

Each step of the workshop (present, future, and pathway) was organized around a discussion about four themes:

**Theme I: Natural resources (in particular use and land cover).**

**Theme II: Social Development in the countryside and cities (access to education, health, employment, violence, conflict).**

**Theme III: economic activities, infrastructure and technology.**

**Theme IV: institutional and political context.**

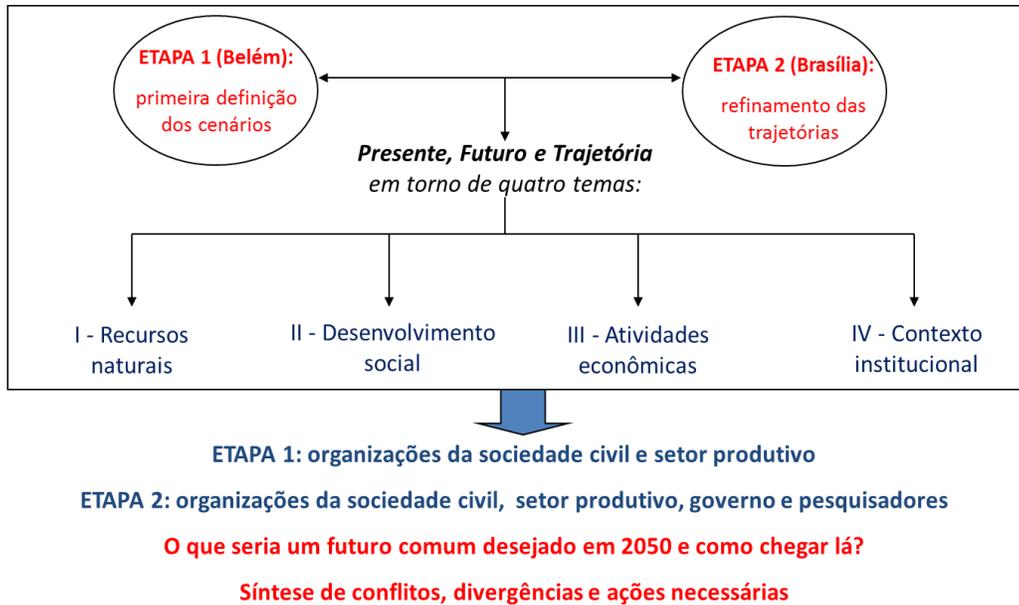


Figure 2. Workshops structure

This document is organized as follows: Section 2 presents the list of participants for each workshop. Section 3 describes the steps for constructing the scenarios. Section 4 presents a summary of the final results (presented in full in Annex A, B and C). Section 5 finally presents reached conclusions.

## **I.2. Stakeholder participation**

### **I.2.1 Workshop in Belem**

Starting from the 200 institutions identified in 2012, 30 names were selected. The team responsible for workshops sought to privilege the representative diversity within the categories established by the AMAZALERT Project. In this first workshop the goal was to build the scenarios from the perspective of representatives of society, not the government or research institutions. Thus, we prioritize non-governmental organizations with more environmentally focused, non-governmental organizations acting with local societies and representations of the productive sectors of agribusiness, livestock, forestry and minerals. As a representative of the Federal Government, only the Department of Strategic Affairs (SAE) was called for the first workshop. The selection criteria were based on the historical trajectory of the institutions and also in memory of the surveys and case studies developed by CCST - INPE, Goeldi Museum and Embrapa. Of the 30 invited, 20 were confirmed (Table 1.), and effectively appeared 15 institutions. Thus, the first Participatory AMAZALERT Scenario workshop had representation from at least one representative of the intended sectors. Table 2 presents the list of mediators and organizers of the workshop. Altogether, the 1st workshop had 26 participants.

Table 1. List of civil society organizations and stakeholder participants in Belem workshop (alphabetical order)<sup>2</sup>

	Institution (Abbreviation)	Institution (complete name)	Site	Name(s) of representative(s) at workshop
1	ABC	Associação Brasileira de Criadores	<a href="http://www.abccriadores.org.br">www.abccriadores.org.br</a>	Helio Madalena Jr
2	ABIOVE	Associação Brasileira da Indústria de Óleos Vegetais	<a href="http://www.abiove.org.br">www.abiove.org.br</a>	Bernardo Pires
3	ABRAFRIGO*	Associação Brasileira dos Frigoríficos	<a href="http://www.abrafrigo.org.br">www.abrafrigo.org.br</a>	Gil Reis
4	AIMEX	Associação da Indústria dos Exportadores de Madeira do Pará	<a href="http://www.aimex.org.br">www.aimex.org.br</a>	Gilberto Carvalho
5	ALCOA	Alcoa Aluminios S.A.	<a href="http://www.alcoa.com.br">www.alcoa.com.br</a>	Milene Maués
6	CIMI*	Conselho Indigenista Missionário	<a href="http://www.cimi.org.br">www.cimi.org.br</a>	Marcos Borges ou Claudemir Monteiro
7	CNS	Conselho Nacional da Populações extrativistas	-	Manoel Silva da Cunha
8	CPT*	Comissão Pastoral da Terra	<a href="http://www.cpt.org.br">www.cpt.org.br</a>	Padre Paulinho
9	CTA e CCM	Centro de Trabalhadores da Amazônia e Comitê Chico Mendes	<a href="http://www.cta.org.br">www.cta.org.br</a>	Julia Feitosa da Silva Dias e Marcos Jorge Dias
10	FAEPA*	Federação de Agricultura e Pecuária do Pará	<a href="http://www.faepa.org.br">www.faepa.org.br</a>	Dr. Carlos Xavie
11	FASE	FASE – Educação e Solidariedade	<a href="http://www.fase.org.br">www.fase.org.br</a>	Graça Costa
12	FNBF*	Fórum Nacional de Atividades de Base Florestal	<a href="http://www.forumflorestal.org.br">www.forumflorestal.org.br</a>	Guilherme Carvalho
13	FSC/IFT	Instituto Floresta Tropical	<a href="http://www.ift.org.br">www.ift.org.br</a>	Marcos Lentini
14	FVPP	Fundação Viver Produzir e Preservar	<a href="http://www.fvpp.org.br">www.fvpp.org.br</a>	Diego Luiz do Nascimento
15	GREENPEACE	Greenpeace	<a href="http://www.greenpeace.org">www.greenpeace.org</a>	Edwin Keiser
16	IEB	Instituto Internacional de Educação do Brasil	<a href="http://www.ieb.org.br">www.ieb.org.br</a>	Manuel Amaral
17	ISA	Instituto Socio Ambiental	<a href="http://www.isa.org.br">www.isa.org.br</a>	Renata Alves
18	TNC	The Nature Conservancy	<a href="http://www.tnc.org">www.tnc.org</a>	Iam Thompson
19	SAE	Secretaria de Assuntos Estratégicos	<a href="http://www.sae.gov.br">www.sae.gov.br</a>	Arnaldo Carneiro
20	VALE	Vale S.A.	<a href="http://www.vale.com">www.vale.com</a>	Leonardo Neves ou Francinaldo Magno

\* Not appeared

<sup>2</sup> As a representative of the Federal Government, only the Secretariat for Strategic Affairs (SAE) was called in the first workshop. The government sector attended the second workshop.

The workshop was chaired by researchers from the Embrapa Satellite Monitoring, INPE and partner institutions in the Amazon (IDESP and Goeldi Museum of Pará), Table 2.

Table 2. Mediators / organizers of the workshop (EMBRAPA coordination / CNPM and INPE / CCST)

<b>Institution (Abbreviation)</b>	<b>Institution (complete name)</b>	<b>Site</b>	<b>Name(s) of representative(s) at workshop</b>
EMBRAPA/CNPM	EMBRAPA Monitoramento por Satélite (Ministério da Agricultura)	<a href="http://www.embrapa.br/monitoramento-por-satelite">http://www.embrapa.br/monitoramento-por-satelite</a>	Cláudio Bragantini, Elza Kawakami Savaget, Mateus Batistella, Sérgio Tosto
INPE/CCST	Centro de Ciência do Sistema Terrestre - Instituto Nacional de Pesquisas Espaciais (Ministério da Ciência, Tecnologia e Inovação)	<a href="http://www.ccst.inpe.br/">www.ccst.inpe.br/</a>	Ana Paula Aguiar, Celso Von Randow, Patrícia Pinho, Peter Mann de Toledo, Roberto Araújo
MPEG	Museu Paraense Emílio Goeldi (Ministério da Ciência, Tecnologia e Inovação)	<a href="http://www.museu-goeldi.br/">http://www.museu-goeldi.br/</a>	Ima Célia Viera
IDESP	Instituto de Desenvolvimento Econômico, Social e Ambiental do Pará (Secretaria de Estado de Gestão do Pará)	<a href="http://www.idesp.pa.gov.br/">http://www.idesp.pa.gov.br/</a>	Andréa Coelho

Below is a brief description of the participating organizations in categories according to the focus of activity and represented interests.

*Environmental NGOs:*

- TNC - Founded in 1951 by a group of North American scientist, interested in studying and protecting nature. Operating in Brazil since 1988 and has the mission of working for the conservation of natural areas and waters on which life depends. Its main focus is on the conservation of natural resources especially water resources.
- ISA - with historical role in indigenous traditional communities, since 1994, its mission is to build "sustainable solutions that ensure collective and diffuse rights and value the environmental diversity
- GREENPEACE - Non-profit and independent organization that does not accept donations from governments, corporations or political parties. Entire work is funded by donations from millions of civilian employees worldwide. Present in 43 countries, entitled as a global organization has the task to protect the environment and for the promotion of peace and seeks to inspire changes in attitude which will ensure greener and cleaner future for present and future generations.
- IIEB - Their aim is spreading knowledge through publications, qualification courses with specialized courses, themed events and training grants.
- FASE - Education and Solidarity: aims sustainable human development, based on criteria of local development. Work with agro ecological alternatives and cooperative enterprise, ensuring the right to the forest, to land, food, water and culture, democratization of local political management, protection of socio-environmental diversity and traditional knowledge in heritage management, among other. For FASE Amazon has a weight that extrapolate understanding generally widespread, and is regarded as the world's largest rainforest reserve, water and biodiversity.

*Social movement (traditional, indigenous and family farms)*

- CNS - Fights to defend the Amazonian forests, is engaged in the struggle for the realization of land reform. It also considers that extractive reserves are concrete results in the formation of the territories and important tool in the provision of environmental services.
- CTA - Institution that appeared during the 70s, initially as the base of rural rubber tappers trade unions of Xapuri in Acre, in order to face the pressure on landowners. They were institutionalized in 1983. Since then, CTA seeks to respond the social demands coming from the latex harvest communities.
- CCM - The Committee Chico Mendes is a network of non-governmental institutions (CNS, CTA, CUT, CIMI, SOS AMAZON, CDDHEP, SINDSEP-AC, CPT, etc.) without legal personality, is an entity of memory, created on the night of murder Chico Mendes 22/12/1988. It aims to combat impunity for crimes against the extractive and agricultural workers; their institutional mission is "Fighting for justice and rights of the rubber tappers and agricultural workers and against impunity."
- FVPP – It is founded in 1991 on the initiative of the peasant organizations, pastoral movement, urban and popular educators of Trans-Amazon Highway and the Xingu River. It is a non-profit organization that was formed to address families abandoned from public policies of settlement programs. Currently its institutional mission is to contribute to sustainable development policies in the Amazon.
- CPT - Founded in 1975 by the National Conference of Bishops of Brazil (Catholic) in response to the situation of rural workers, squatters and pedestrians especially in the Amazon. Currently is an ecumenical organization that incorporates other Christian churches such as Evangelical Lutheran Church of Brazil. In each region of Brazil works according to local challenges, considering human rights.
- CIMI - Founded in 1972 is linked to CNBB and with the goal to "respect the indigenous culture in their ethnic, cultural and historical plurality", believe that indigenous people

are a source of inspiration for the revision of the senses, the story and direction of social practices and economic.

- CONTAG - Founded in 1963 it is a confederation that unites 27 associations of workers from agriculture (FETAG) and the trade unions and affiliated rural workers.

#### *Forest Sector*

- AIMEX - is an association of the forest-based companies and focus on sustainable management, encouraging its members to use the method of good practice. Also maintains a laboratory seedlings and seeds of forest trees of the Amazon, and made them available to rural producers and entrepreneurs who want to reforest more affordable.
- IFT - The institution that developed the methodologies and spreads best practices for logging in the Amazon. Furthermore, it is considered a centre of excellence and improvement of forest management in the Amazon - Reduced Impact Logging. It is also considered a centre of excellence and improvement of forest management in the Amazon.
- FSC - International certifier founded in 1993 with headquarters in Germany, represented nationally in about 70 countries. Operates in Brazil since 1996 and through the certification system recognizes the responsible production of forest products, which favours the use of good practices, which has to reduce environmental impacts, and to improve social equity groups involved in the activity. This way it makes information regarding these products more available for consumers and businesses to make more conscious decisions.

#### *Livestock and Agriculture Business*

- CNA - Represents, organizes and strengthens Brazilian farmers. Also defending their rights and interests to promote economic and social development of the agricultural sector. To do this congregates associations and rural leaders and participates actively and permanently in discussions and decisions on national agricultural policy. CNA system covers the SENAR which focuses on Professional Training and Social promotion in rural area and CNA Institute that aims researching and studying of agribusiness social matters.
- ANEC - Founded in 1965, is meant to promote the development of activities related to grains and cereals. It is an association with 35 member companies, with 20 effective and 15 contributors. ANEC's mission is to develop the best scenario for import and export of soybeans and corn, in all its marketable forms, and the assistance to associate by mapping the future scenario and interaction with the government.
- ABC Breeders - Association formed by ranchers beef and dairy founded in 1926 as the Federation of Cattle Breeders. Today, after 85 years of activities conducted throughout the country, it is considered as one of the first associations of rural nature which represents business owners and professionals dedicated to animal production.
- FAEPA- founded in 1951 the Federation of Agriculture and Livestock of Para is maintained by farmers and it is a part CNA and aims to defend the interests of affiliated unions and agricultural producers.
- ABRAFRIGO - represents the industrial segment of the beef with national coverage. It is the institution that establishes dialogue with the various instances of government, national and international markets.

### *Mining*

- IBRAM - National entity representing companies and institutions working in the mining industry. It is non-profit entity that promotes the integration of the sector as well as promoting sustainable development and use of best practices in occupational safety and health in mining. Additionally it stimulates the studies, research, development and innovation in this sector.
- VALE S.A - Considered being one of the largest mining companies in the world, it was nationalized in 1942 and privatized by Getúlio Vargas in 1997 the government of Fernando Henrique.
- ALCOA S.A - - Private company that operates in 31 countries. Since 1965 it exist in Brazil and operates in the whole production chain of the metal from bauxite mining to the production of transformers. Additionally it has shareholdings in four hydroelectric power stations: Machadinho and Barra Grande on the border of Santa Catarina and Rio Grande; Sierra Hawk in Goiás; Strait between Maranhão and Tocantins.

### **I.2.2 Workshop in Brasilia**

The second workshop aimed to refine the paths that were discussed at the first Workshop, focusing on public policy. Therefore, priority was given to guests from the Government that could contribute to the discussion of the scenarios started in the first workshop. It was also decided to prioritize organizations that operate throughout the Amazon region, so the decision was to hold the workshop in Brasilia and invite representatives from different ministries (Environment, Agricultural Development, Agriculture, Social Development, Planning, Science and Technology, Civil Office, Fishing, etc.). There were also invited some of the participants of the 1st Workshop and representatives of the financial sector and investment banks. Table 3 presents the list of guests and those who attended. Table 4 presents separately the participants of the research institutions that are part of the project or associated projects, and supported the mediation workshop. Altogether, the workshop had 30 participants.

Table 3. 2nd Workshop - Representatives from government, civil and financial sector

NAME	INSTITUTION	<i>Accepted invitations</i>	<b>Present</b>
ADALBERTO EBERHART	MMA - Diretoria de Zoneamento Territorial	1	1
ANTONIO CARLOS HUMMEL	MMA – Serviço Florestal Brasileiro	1	
BRUNO PAGNOCCHESCHI	ANA - Coordenação de Gestão Estratégica	1	1
CELSO SANTOS CARVALHO	Ministério das Cidades	1	
CRISTIANE MOUTINHO COELHO	EPE - Empresa de Pesquisas Energéticas	1	1
EDENISE GARCIA	The Nature Conservancy	1	1
EDUARDO DALBOSCO	MDS – Assessor Parlamentar	1	
EVILSON NUNES	MAPA – Dep. de Sistema de Produção e Sustentabilidade	1	1
FABIO ABREU	MMA	1	
FELIPE LIMA RAMOS BARBOSA	MMA	1	
FRANCISCO BARBOSA DE OLIVEIRA FILHO	MMA – Dep. de Políticas para Combate ao Desmatamento	1	
GUSTAVO LUEDEMANN	MCT - Diretoria de Mudanças Climáticas	1	
HELIO MADALLENA JUNIOR	ABC Criadores	1	1
HENRIQUE GONÇALVES DE ALMEIDA	Ministério da Pesca e Aquicultura	1	1
SUSANA GOMES	Ministério da Pesca e Aquicultura	1	
JOAO BATISTA UCHOA	Fundação Viver Produzir e Preservar	1	
JOSE GUILHERME TOLLSTADIUS LEAL	MAPA – Dep. de Sistema de Produção e Sustentabilidade	1	
JOSE HUMBERTO CHAVES	MMA – Gerente Executivo de Monitoramento e Auditoria Florestais	1	
JULIA FEITOSA	CTA - Conselho dos Trabalhadores da Amazônia	1	1
LEONOR COLLOR	European Commission	1	

MARCOS JORGE DIAS	Comitê Chico Mendes	1	1
MARINÊS MORENO DE SOUZA LINO	Banco Basa	1	
NATALIE UNTERSTELL	SAE/PR – Secretaria de Assuntos Estratégicos da Presidência da República	1	
NAZARÉ LIMA SOARES	MMA	1	
ODUVAL LOBATO NETO	Banco BASA	1	1
NATHALI GERMANO	FUNAI – Coordenadora de Gestão Ambiental	1	1
PAULO MAURICIO ALENCASTRO DA GRAÇA	INPA – Coordenador de dinâmicas ambientais	1	1
PEDRO RONALT VIEIRA	Ministério da Defesa - Diretoria de Serviço Geográfico (DSG)	1	1
PIERO VENTURI	European Commission	1	1
TAIGUARA ALENCAR	MMA – GIZ MMA	1	1
WIENER MEDEIROS	MMA	1	1
SERGIO LOPEZ	MDA – Terra Legal	1	1

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Table 4 - Mediators / organizers of the 2nd workshop (EMBRAPA coordination / NMA and INPE / CCST) and researchers associated projects

<b>Institution (Abbreviation)</b>	<b>Institution (complete name)</b>	<b>Site</b>	<b>Name(s) of representative(s) at workshop</b>
EMBRAPA/CNPM	EMBRAPA Monitoramento por Satélite (Ministério da Agricultura)	<a href="http://www.embrapa.br/monitoramento-por-satelite">http://www.embrapa.br/monitoramento-por-satelite</a>	Cláudio Bragantini, Elza Kawakami Savaget, Mateus Batistella, Marko Monteiro (guest student UNICAMP)
INPE/CCST	Centro de Ciência do Sistema Terrestre - Instituto Nacional de Pesquisas Espaciais (Ministério da Ciência, Tecnologia e Inovação)	<a href="http://www.ccst.inpe.br/">www.ccst.inpe.br/</a>	Ana Paula Aguiar, Celso Von Randow, Roberto Araújo
IDESP	Instituto de Desenvolvimento Econômico, Social e Ambiental do Pará (Secretaria de Estado de Gestão do Pará)	<a href="http://www.idesp.pa.gov.br/">http://www.idesp.pa.gov.br/</a>	Andréa Coelho
Wageningen University	-	<a href="http://www.wageningenur.nl/">http://www.wageningenur.nl/</a>	Bart Kruijt Kasper Kok, Pedro Zanetti (fellow guest UFRJ)
EMBRAPA SOLOS	EMBRAPA Solos (Ministério da Agricultura)	<a href="https://www.embrapa.br/solos">https://www.embrapa.br/solos</a>	Margareth Simões (guest ROBIN project)

### I.3. Methods

The proposed method is based on the approach proposed by Folhes (2010) Folhes et al. (submitted). The workshops were organized in separate steps to discuss the PRESENT, FUTURE and PATHWAY for two opposite scenarios (a desired and not desired) considering socioeconomic and environmental aspects in an integrated way. It was discussed about scenario with high social and environmental development (SUSTAINABILITY, Scenario A), as opposed to a future with low social and environmental development (CHAOS, Scenario C), as shown in Figure 1. Activities were held in plenary or group, supported by a group of mediators, using simple features like tables and keywords (Figure 2).



Figure 2: Photos of the first Workshop illustrating used resources.

For organizational purposes, the discussion of each step was organized around four themes:

**Theme I:** Natural resources (in particular use and land cover).

**Theme II:** Social Development in the countryside and cities (access to education, health, employment, violence, conflicts).

**Theme III:** economic activities, infrastructure and technology.

**Theme IV:** institutional and political context.

The themes were suggested by researchers and presented at the opening of the first Workshop, as summarised in Box 2.

Box 2. Details of topics for discussion at the first Workshop

**Theme I: Natural resources**

**Deforestation**

**Forest degradation and fire susceptibility**

**Secondary vegetation**

**Poultry**

**Environmental services (biodiversity, water quality and availability, soil)**

**Protected areas**

**Theme II: Social Development in the countryside and cities**

**Access to education, health, mobility, housing, employment, credit**

**Agrarian and urban violence conflicts**

**Theme III: Economic activities, infrastructure and technology**

**Dominant economic sectors**

**Land use**

**Transport, sanitation and energy infrastructure**

**Technologies**

**Theme IV: Institutional and political context**

**The State Role**

**Rule of law**

**Market regulations**

**Globalization**

In this section we detailed steps of the workshops, describing how the results presented in Annexes A, B, C and D were obtained. The steps were:

**Phase 1:** (held at the 1<sup>st</sup> Workshop): PRESENT (Theme)

The first phase consisted of building conjunction tables (in plenary with all participants) summarizing the present, using pictures and keywords by theme.

**Phase 2:** (held on the 1<sup>st</sup> Workshop): FUTURE (Vision 2050 per theme)

This phase consisted of discussing (also in plenary) a vision of the future in 2050 in Scenario A (Sustainability) and Scenario C (Fragmentation / Chaos). This discussion was also conducted using pictures and keywords by theme.

**Phase 3:** (held at the 1<sup>st</sup> Workshop): FUTURE (Vision 2050 with narration)

Narratives have been written into two groups (Scenario A and Scenario C), (like essays) consolidating the vision of the future discussed in Step 2, tackling discussions about the future among topics. In parallel, the group began a discussion of the actions that would lead to Scenario A or C (called pathways). The results were presented in plenary.

**Phase 4:** (held at the 2<sup>nd</sup> Workshop): PATHWAYS

The results of the first workshop (Phase 1, 2 and 3) were presented at the opening in the plenary of the workshop and distributed to participants. Then, in groups by subject, the results of steps 1 and 2 were reviewed. Attention then turned to the discussion of pathways and the actions needed to reach the future outlined in Scenario A, in each subject. Next, the exercise in Scenario C was repeated.

## **I.4. Results**

The results of Phase 4 described in the previous section were compiled by the researchers and subsequently reviewed by the speakers of the groups. The results of this review process are consolidated in the Annexes:

- Annex A - PRESENT - displays the contents of tables prepared in Phase 1 of the 1st Workshop, revised 2nd Workshop, organized by theme.
- Annex B - SCENARIO A - FUTURE VISION AND PATHWAYS
- Annex C - SCENARIO C - FUTURE VISION AND PATHWAYS
- Annex D - brings some other intermediate outcomes, such as narratives and trajectories from Phase 3), and photos of the tables of the 1<sup>st</sup> workshop. All original material from the workshops is available and can be sent by the organizers. In this section, researchers proposed a synthesis of the main points on Present, Future and Pathways, compiled from analysis of Annexes A, B and C.

### **I.4.1 Present**

#### *I.4.1.1 Social development*

One of the points most emphasised by the participants during the first workshop was the process by which the medium and large cities in the Amazon have been through, that -in function of the services they offer, although of poor quality - attract large populations coming from migration and rural exodus to their peri-urban areas, increases even further the levels of violence and poverty existing in these cities. The migratory dynamics that involves the same is associated with points discussed at the workshop: (a) the negative effects produced by the installation of large projects in the region as works of transport infrastructure / energy projects and the mining sector, which attract people to cities , which in turn does not have infrastructure to support population growth, particularly by increasing the demand for services such as health, education, safety, housing, communications, energy, among others. An emblematic case is the current city of Altamira, which suffers from the changes caused by the implementation of AHE Belo Monte in neighbouring Vitória do Xingu, but by offering greater network services attracts the larger number of inhabitants than the city where the project is being built. Another problem considered is the demobilization phase of the hand labour and the subsequent construction of the resort, when jobs are scarce causing the local economy becomes depressed, because in general there is not a regional development project that considers these steps. (b) the ineffective implementation of the protected areas, leaving traditional populations (forest people) without survival prospects, and making them vulnerable against the advancement of agricultural and infrastructure projects under construction or planned for the region; (c) situation of INCRA settlements, many created in isolated areas without infrastructure and alternatives. It was observed an inversion of the role of settlements created in the past decade in forest areas to meet the demand for wood, not to fulfil their social role; (d) Failure and / or ineffectiveness of public policies for family farming. This condition causes the producers give up the activity or at least not feel encouraged to keep their children on the field, mostly encouraging their children to work and seek some productive activity in the city.

#### *I.4.1.2 Economical activities*

Main economic activities include: Recognition of how important is the mining activity to the region's economy, and with significant potential for expansion it has, due to its large existing mineral reserves, and the relevance that the market for this type of commodity possesses for the national trade balance and growing demand in the international market. There is, however, great concern about the social and environmental impacts in the short, medium and long term generated by the activity; (b) weakening trend of the forestry sector, the slowness of the process initiated by

grant SFB, greater control of illegal activity by the government (although there is still corruption in the issuance of the environmental licenses), and alternative markets of raw materials for construction and furniture industry (reforestation wood, for example); (c) although there is a tendency to increase the area of agriculture in the Amazon (food and biofuel), perspective is that more mechanic livestock remains the dominant activity - and that agriculture expands primarily by Cerrado, well as in some axes of the Amazon (as BR163, for example). For planned infrastructure projects or in the one in progress, defined in PAC2, give priority to meeting the needs of productive activities such as grains and minerals that require the optimization of logistics for production and enhancement of national energy matrix at the expense of social development region.

#### *1.4.1.3 Natural Resources*

Main aspects related to natural resources include: (a) shallow-cut logging with abrupt fall from 2005, and fluctuations around 6000 km<sup>2</sup> / year over the past three years; high rates of forest degradation; (b) recent data show an increase in the area of secondary vegetation (increase of 1% per year); (c) issues regarding transnational river basins in countries without environmental governance; (d) concern with the commercialization of nature and exploitation of natural resources without sharing benefits and social transformation; (e) a tendency to increase in extreme events, especially droughts and floods.

#### *1.4.1.4 Institutional and political context*

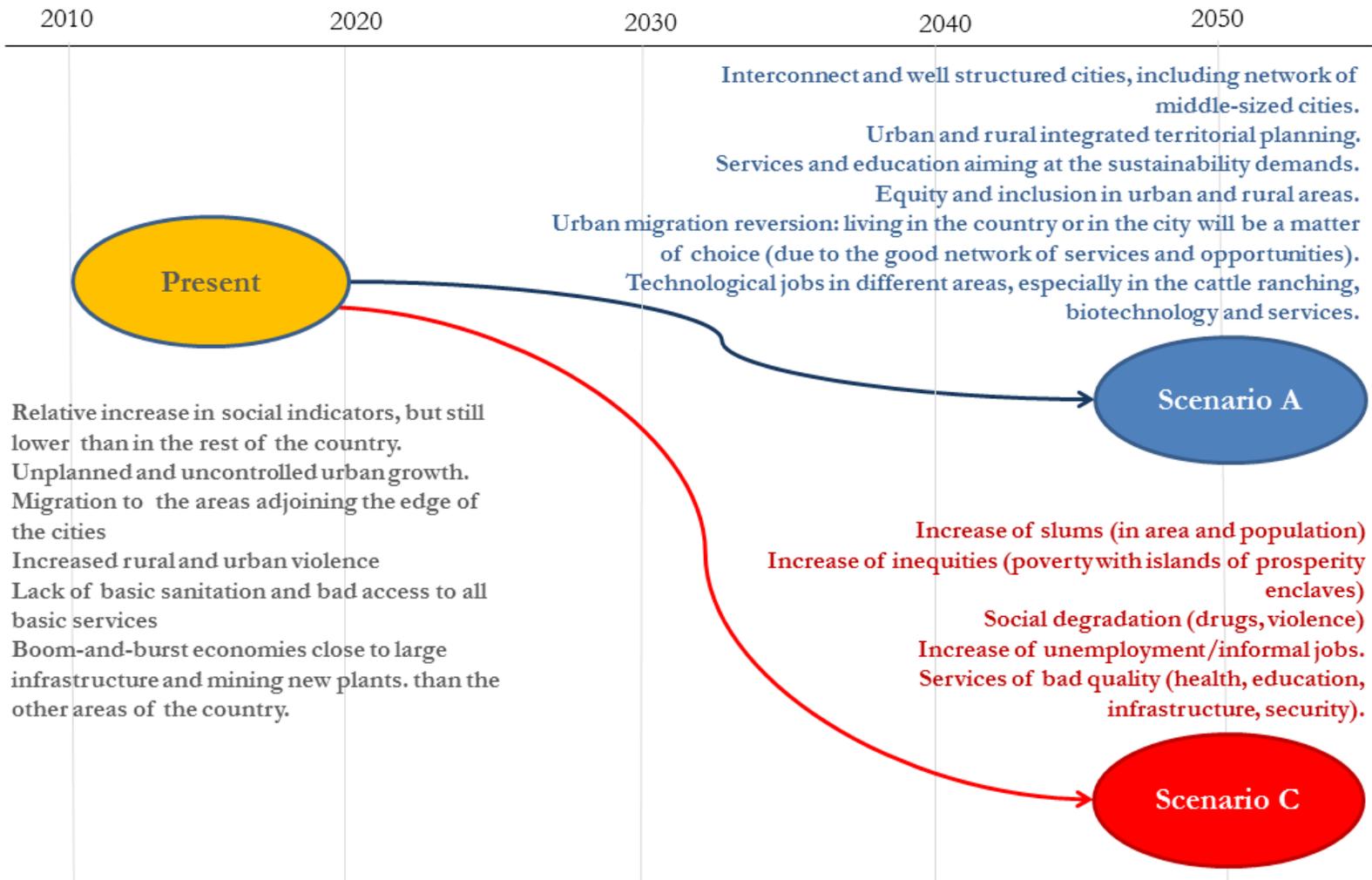
Main aspects include: (a) concern with reviewing legal frameworks according to demands of the productive sector only. For example, pressure on indigenous lands, including data showing soy plantations on indigenous lands over lease, and possible revision of their boundaries; (b) the importance of efforts to spatial planning (zoning, protected areas), land regularization, the organization of logging activities by SFB, payments for environmental services, local clusters. However, all these efforts are partial and / or incipient, not completing all the necessary cycle to ensure sustainability. c) In terms of public policy, that in fact worked in the Amazon was the component command and control PPCDAM. But is this enough? The reduction in Amazon deforestation was a response to global pressure on the carbon problem, but until when? Food safety problem for the global population in the coming decades may supplant issue of global warming and biodiversity? (d) Street movements indicate a flattening of democracy and give priority to the reduction of inequality in access to services. On the other hand, there is a greater awareness of the environment, the place where one lives, including by companies (but not appeared in the street movements for now); (f) At the end, we emphasize the questioning ability of the current model to promote sustainability, to seek solutions focused on market and consumption, treating people out of the market as invisible. State's role as a mediator and regulator needs to be discussed.

#### **I.4.2 Visions of the future for 2050**

Scenario A (Sustainability): a future with well-structured cities, quality of life for the entire population, diversified economic activities in all sectors, natural resources preserved and widely used for different purposes in a sustainable manner and by different stakeholders, integrated land management considering environmental, social and economic aspects, as illustrated in Figures 3.a 3.c (axis natural resources and social development; in Portuguese, see annexes for English translations). Scenario C (Chaos / fragmentation): a future with exhausted natural resources, poor quality of life for the majority of society, with islands of prosperity and unequal access to services and opportunities. Figure 3a and 3b illustrates some key aspects of the envisioned futures for the Natural Resources and Social Development themes (for a complete description, refer to A, B and C).

Scenarios A and C are extreme scenarios, and considered by many participants very unlikely but plausible. Scenario B (Half Way) was not detailed in the workshop, but is considered a more likely scenario. Scenario B combines elements of social development and environmental heterogeneously-gradation course of action will depend on the society in coming decades as much to solve structural social problems of the region, as well as for dealing with the external demand for food and commodities. The option for the extremes occurred precisely to provide discussion about actions toward (pathways) to future of Sustainability - with emphasis on the power of intervention of local actors, without disregarding the global context.

## SOCIAL DEVELOPMENT: CONTRASTING VISIONS IN 2050



(a)



### **I.4.3 Pathways to arrive at visions (scenario endpoints)**

#### *I.4.3.1 Scenario A: Sustainability*

In scenario A, we propose to group the main activities listed in Annex B in three items, up to a point related to distinct, complementary and interconnected ranges. The first item refers to broader institutional issues. A second item, which includes a range of activities related to land management in urban and rural areas by integrating environmental, social and economic aspects measures. Finally, a specific item on actions related to large enterprises, due to the importance and concern about this issue during the workshops.

#### *General level:*

- Renewal of the Social Contract: allow effective access to rights provided in the legal framework (institutional reform and consolidation of the rule of law).
- Strengthening of cities with infrastructure, network services and appropriate education to meet the demands of sustainability, aiming an interconnected network of medium-sized cities.
- Increased management capacity of municipalities, and consolidation of mechanisms for Integrated Management of Territories, as discussed below.
- Consolidation of monitoring and control systems started in PPCDAM, but linked to actions of social and economic order, in the context discussed below, and the expansion of enforcement capacity of environmental crimes as a whole.
- Consolidation, review and extension of planning instruments / land management and land tenure (environmental licensing, ZEE, Plans, SNUG, CAR) to meet the environmental, social and economic demands effectively.
- Reform of the judiciary and of the police and public security institutions, with increased rates of condemnation for violations of the law and ending impunity.
- Valuing of primary and secondary forests through the implementation of PES (Payments for Environmental Services) and integration with AFS (agroforestry) programs, respectively.
- Adoption of tripartite councils (government, productive sector and users) to discuss issues related to the different production chains (various scales).
- Integration of activities with neighbouring countries in different sectors (economic opportunities (e.g. tourism), environmental monitoring, integrated watershed management, drug trafficking, etc.).

#### *Integrated Management of Territories:*

- Integration (within the territorial bases) between social policies to combat poverty (such as Bolsa Familia, Bolsa Verde, My House My Life), environmental and incentives for the production, following the criteria of the system and considering local particularities (agendas, uses and practices of the population).
- Implementation of instruments for integrated urban and rural planning, considering socioeconomic and environmental factors at the landscape scale (ecological corridors, rebuild international reserves, land uses, different types of actors, environmental services, etc.).
- Incentives to diversify local economies (services, industry, trade, tourism), with integrated strengthening urban and rural areas, reducing the distinction between them.
- Organization of local supply chains, focusing on agricultural production to supply the urban centres and large enterprises in the Amazon, in addition to national and international markets.

- Training, training centres (education and research) and technical assistance aimed not only agricultural activities, but also new urban markets and segments, focused on the use of natural resources, development of new technologies and new ventures.
- Planning for the implementation of large projects (see below) in order to promote local economic activities and avoid boom-bust economies of the cities), consistent with land management.
- Incentives for widespread adoption of technologies with economic and environmental sustainability in various sectors.
- In livestock, specifically, production diversification, by advancing aquaculture and small animals. Encourage small / medium / large (state as mediator) integration.
- Reallocation of structured settlements with management for peri-urban areas seeking food demand of cities.
- Organization and revitalization of urban space for better social integration, providing alternatives for young people (parks, nurseries, sports courts, schools, etc.).
- Large projects:
- Planning for the implementation of large projects integrated land management (avoid boom-bust economies of the cities).
- Planning of infrastructure geared to the needs of the population (river transport, for example), as the market demands (production flow).
- Ensuring that basic environmental plans of ventures in the region are met and monitored systematically.
- Compatibility between projects and objectives of Protected Areas, Indigenous Lands and Settlements, so that builders consider specific areas and interests of the population.
- Improvement of corporate social responsibility in large developments and best use of royalties by the government, with popular participation.

#### *1.4.3.2 Scenario C:*

Many of the points listed in Annex C reflect the absence of the actions listed in Annex B, with emphasis on:

- Discontinuity of monitoring systems, e.g. PPCDAM.
- Review of legal frameworks aimed only at the macroeconomic interests - at the expense of social and environmental aspects - leading to a regression of the positive results obtained so far (drop in deforestation, for example).
- Use of cities (and standardized housing programs) to create depots workforce underemployed, without investment.
- Lack of shares consolidation or improvement of instruments for territorial and land use planning that can counteract the pressure of the market for land.
- Infrastructure works without social and environmental consideration.
- Absence of effective actions to re-establish the Social Contract and reduce inequality in access to services and opportunities.

## I.5. Policy implications of the qualitative and quantitative scenarios

This section is taken from Deliverable 4.2. It is reproduced here because of the strong connection with the information presented in Part I. For more details on the land use model and model results, we refer to Deliverable 4.2.

The large differences between Scenarios A, B and C developed within AMAZALERT reflect the current level of uncertainty about the future of the region. In the case of Brazil, until the beginning of the last decade, the aggressive deforestation and illegal land appropriation processes in the region seemed to be uncontrollable, peaking at 27,772 km<sup>2</sup>yr<sup>-1</sup> in 2004. Clear-cut deforestation rates have been decreasing since then, establishing at approximately 6000 km<sup>2</sup>yr<sup>-1</sup> in the last three years. Although some recent analyses have discussed the role of commodity prices and other economic factors in the slowdown of deforestation rates, most have unveiled the integrated set of actions taken by the Brazilian Federal Government to curb deforestation as a decisive factor. These measures included the creation of protected areas, the use of effective monitoring and control systems, and credit restriction mechanisms. In 2010, the Brazilian government committed to an 80% reduction in clear-cut deforestation in the Brazilian Amazon by 2020 compared with the 1996-2005 average annual rates (Federal Decree 7390 of 9 Dec. 2010). However, multiple other forces can potentially contribute to the return of high deforestation rates in the next decades. Among them the rapidly expanding global markets for agricultural commodities fuelled by the increasing world's population and consumption, large-scale transportation and energy infrastructure projects, and - no less important - weak institutions.

In this context, AMAZALERT developed new and contrasting scenarios for the land use in the region. For the Brazilian Amazonia they were constructed using participatory, qualitative/quantitative, normative/exploratory approaches. Representatives of diverse sectors of the society contributed to the construction of the qualitative storylines for the two most opposite scenarios. Scenario A ("*Sustainability*") is an ideal/desired normative scenario, in which stakeholders envisioned and detailed major achievements in the socioeconomic, institutional and environmental dimensions - that would constitute a common sustainable future for the region. The opposite Scenario - Scenario C, named "*Fragmentation*" - is a very pessimistic scenario, in which they envisioned a weakening of the efforts of the recent years, mainly in the socio-environmental dimension and a chaotic urbanized Amazonia. For each scenario, stakeholders also defined a comprehensive list of actions which would lead to such the opposite futures. From that list (presented in Deliverable D1.3), we extracted five key points proposed to achieve Scenario A and avoid Scenario C, summarized in Table 7. As the selected items cover short to long term actions, the existing initiatives are mentioned as examples, which should be enhanced, integrated - or even avoided in some cases – according to the proposed actions.

Table 5: Policy recommendations derived from the qualitative scenarios results

ACTION TOWARDS A SUSTAINABLE FUTURE	EXAMPLES (positive and negative)
(a) MONITORING SYSTEMS: continuation and enhancement of the satellite based monitoring systems initiated at PPCDAM, considered as the key aspect to control deforestation. This includes the development of new systems (based on new sensors, for instance), and expansion to other biomes, to avoid leakages.	<i>Examples of current initiatives to be enhanced and expanded: PRODES, DETER, DEGRAD (INPE/MMA), TERRACCLASS (INPE/EMBRAPA).</i>
(b) INTEGRATED TERRITORIAL PLANNING: consolidation and enhancement of multiple instruments for territorial and land use planning, in order to concomitantly regulate pressure for land, create sustainable economic alternatives and integrate social programs at a territorial basis. This includes private and public lands (such as conservation units, indigenous lands, settlements), rural and urban areas.	<i>Several of the on-going public and private initiatives were mentioned as positive examples, although they need to be consolidated and integrated, some effectively implemented (for instance, the SNUC (National System of Conservation Units, ZEE (Ecological Economic Zoning), Land Titling Program, ABC Program (Low Carbon Agriculture), Soy/Beef Moratorium, Certification, Poverty eradication programs, Food Purchase program<sup>3</sup>). Other aspects of the current were mentioned as really negative, such as the lack of economic opportunities in settlements and many protected areas (for instance, extractive reserves).</i>
(c) CITIES RESTRUCTURING: Strengthening of cities to create an interconnected network of medium-sized cities, with infrastructure, proper network of services and education to meet the demands of sustainability.	<i>One of the points most emphasized by the participants during the stakeholder workshops was the process by which the medium and large cities in the Amazon have been through: attracting large populations coming from migration and rural exodus to their peri-urban areas, in spite of the poor services offered, increasing even further the levels of violence and poverty existing in these cities.</i>
(d) LARGE INVESTMENTS PLANNING: Planning for the implementation of large projects (including infrastructure and mining) combined to the integrated territorial planning (item B), avoiding the boom-bust economies of the cities. In the case of infrastructure, planning geared both to the needs of the local population (river transport, for example), as well as market demands (commodities production flow through hydroways).	<i>The city of Altamira, which suffers from the changes caused by the implementation of AHE Belo Monte is an emblematic example (also for item c).</i>
(e) LEGAL FRAMEWORK PROTECTION: enforcement and enhancement of the legislation governing the access to natural resources and land use, creating mechanisms to balance the influence of macroeconomic interests in modifying legal marks at the expense of regional, social and environmental aspects.	<i>The modification of the legal framework aiming solely at specific sectors interests was another item of concern during the workshops, exemplified by the pressure on indigenous lands, including data showing soy plantations on indigenous lands over lease, and possible revision of their boundaries due to the mining code.</i>

<sup>3</sup> See AMAZALERT Deliverable 4.1 for a description of the current policies in place in the Amazon.

It is interesting to notice how these actions consider the environmental and economic dimensions in an integrated way, while aiming at reducing inequality in access to services and opportunities, as a result of the project choice of initial axis (Figure 4). Scenario B (*Middle of the Road*) was not detailed in the workshops, but is considered a more likely scenario combining elements of social development and environmental heterogeneously. If Scenario B will be more similar to A or C will depend on the actions society takes in coming decades as much to solve structural social problems of the region - as well as for dealing with the internal and external demand for agricultural and mining commodities. The option for the extremes occurred precisely to provide discussion about such *actions* toward (pathways) to future of Sustainability - with emphasis on the power of intervention of local actors, without disregarding the global context.

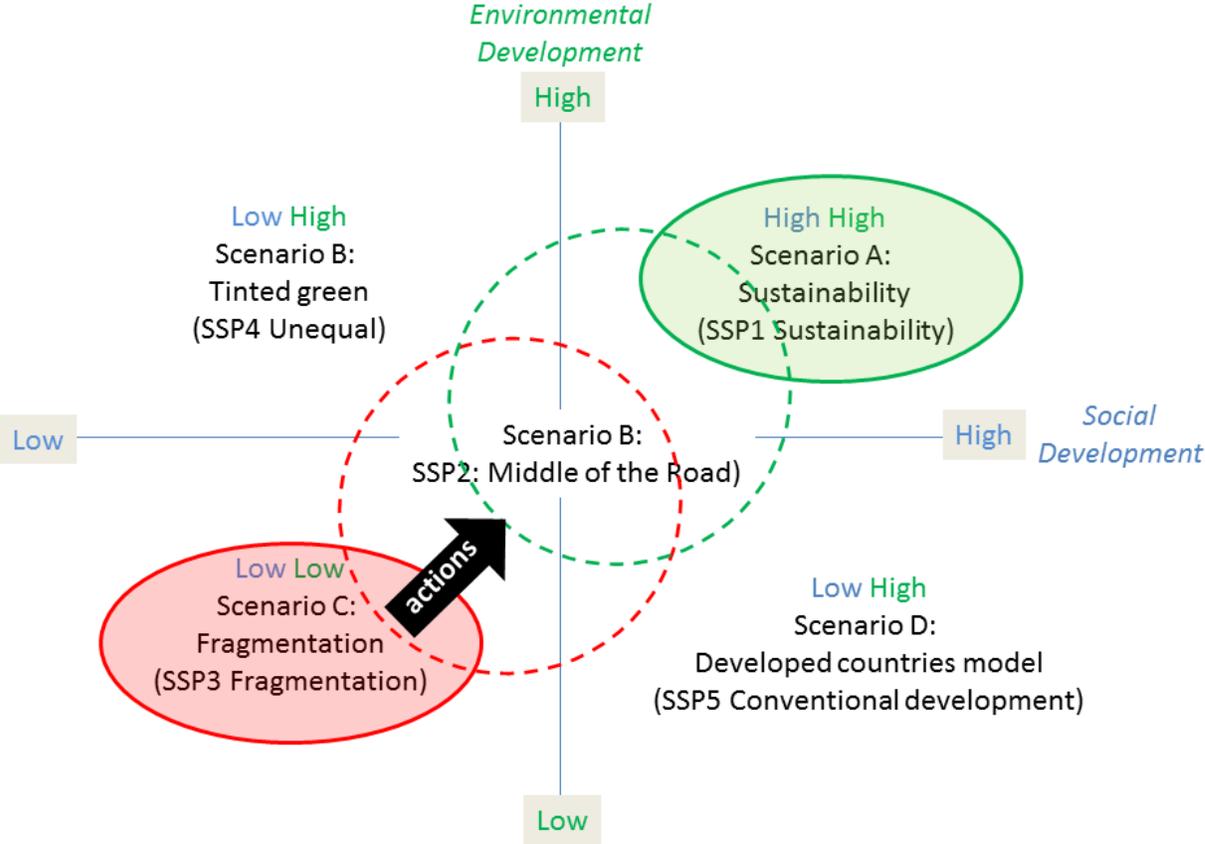


Figure 4: Representation of AMAZALERT scenarios of land use in the context of the Environmental and Social Development axes.

To build a trajectory in the direction of Scenario A, in which natural vegetation areas (primary and secondary) are maintained or even expanded, forests need to be seen as valuable assets by the different actors in the region through their provision of ecosystem services (e.g., biodiversity, carbon, hydrological cycle, bio-products) by the development of a solid forest-based economy, balancing the benefits from forests and agricultural lands to the society as a whole. However, as made clear by stakeholders during the workshops, decreasing deforestation rates or growing secondary forests does not automatically bring socioeconomic development. There is a concern in the region about the deteriorating quality of life in the mid and large-sized cities, due to the lack of

economic options both in rural and urban areas. Finally, the stakeholders also stressed a discussion about a Sustainability Scenario for the Brazilian Amazon cannot be restricted to the Brazilian Amazon. Avoiding deforestation only in the Brazilian Amazon can induce leakages of natural resources degradation in the neighbour countries and in regions of Brazil (especially the Cerrado), as recent studies point out (Dalla-Nora et al. 2014).

*Some considerations on the quantitative results and mitigation implications*

Underneath the similar deforestation patterns in Scenario A and B, lays the difference in the area of secondary forests allowed to regenerate in Scenario A, and consequently in the net CO<sub>2</sub> emission estimates. Aguiar et al. (submitted) estimated that the region could become a carbon sink after 2020 considering Scenario A premises results, with a negative net emission of  $-3\pm 0.3$  PgC from 2011 to 2050. Scenario A in fact represents a Forest Transition scenario for the Amazon (Figure 5). Thus future mitigation options should include incentives to preservation of existing secondary forests and incentive to the regeneration of LR (Legal Reserves) and PPA (Permanent Protection Areas), even above the new Forest Code demands.

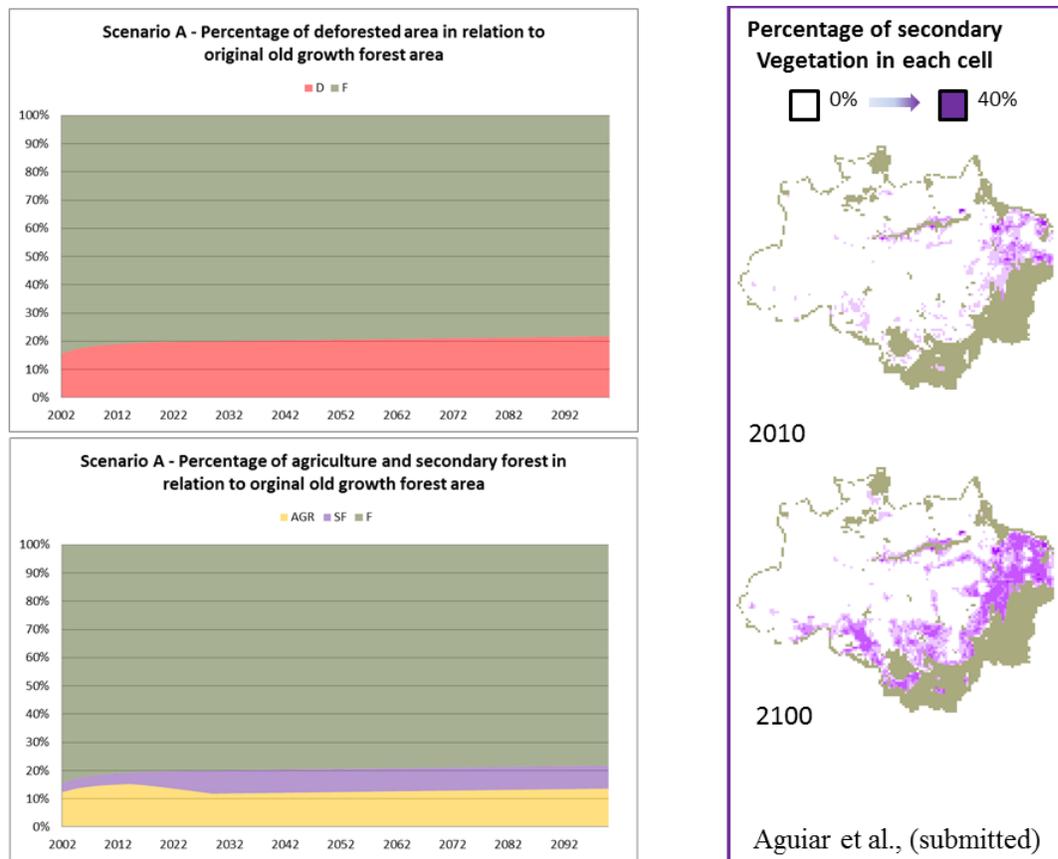


Figure 5: Forest transition scenario in the Brazilian Amazon

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## **I.7. Annexes**

### **I.7.1 Annex A. Present**

#### *I.7.1.1. Natural Resources*

- Deforestation in decline by 2012. Converted 18% of the original forest.
- High forest degradation (fires and illegal logging).
- High environmental liabilities: Legal Reserves (RL) and Permanent Protection Areas (APP) to be restored.
- Mosaic of protected areas: 60% of the region, not fully implemented.
- Deforestation problem in trans boundary basins.
- Increase of extreme events (droughts and floods).
- Expansion of the exploitation of mineral and water resources.
- Expansion of infrastructure (hydroelectric plants, roads, bulk terminals, etc.). Disregarding cumulative environmental and social impacts (PAC - Growth Acceleration Program, IIRSA - Initiative for the Integration of South American Regional Infrastructure).
- Tendency for appreciation / valuation of nature through payment for environmental services (REDD PSA).

#### *I.7.1.2 Social Development*

- Overcrowded cities.
- Intensification of peri-urban migration.
- Rural and urban violence (civil war levels).
- HDI (Human Development Index) increased compared to 2000, but still lower than the rest of the country.
- Intensification of conflicts in areas of human activities that are not prepared to deal with them.
- Deviation of the function of settlements (logging and environmental protection instead of social and agrarian question). Lack of infrastructure (remote sites). Deforestation on the rise in settlements, but perhaps associated with external agents.
- Vulnerability of traditional populations, non-consolidation of Conservation Units. Invisibility of the forest people, with different problems of small farmers and settlers, for example, including land tenure insecurity.
- Allegations of slave labour.
- Sanitation and poor access to basic services in the cities and the countryside.
- Question of political culture (e.g. corruption).
- In large works, compensation policies fail to mitigate the social stresses. Early processes of distributing royalties and compensations of mineral exploration.
- Impact Study and Environmental Licensing primarily considers the physical environment, but leaves little room for social impacts.

#### *I.7.1.3 Economic activities*

- MINING expanding - many investments of large companies. Currently there is a tendency to favour the entry of large mining companies, which contributes to conflicts in former mining areas. Therefore, it is important to distinguish large mining companies and illegal mining (Northern Pará, for example, Crepurisã) which is linked to river pollution (e.g. 800 km in the Tapajos. Currently, besides mercury, there are two other major problems related to mining: Use of cyanide indiscriminately and backhoes.
- INFORMAL ECONOMY: Invisible, with jobs not counted.
- TRANSPORTATION: PAC oriented to market demands not the needs of the population

- **ENERGY:** major engineering works (hydroelectric plants, for example, Belo Monte) causing uncontrolled increase of the population. The impacts are felt even before the project is put in place, such HPPs of São Luiz do Tapajós and Jatoba in the Tapajós. Exploration of oil and natural gas.
- **WOOD INDUSTRY:** declining production. Activity frowned upon. Effort to stabilize the activity by creating the Forest Service. Forest concessions do not happen at the expected rate.
- **INDUSTRY:** concentrated in Manaus. Incipient vertical integration. Low use of biodiversity.
- **LIVESTOCK:** Main land use, as a percentage of converted areas. Chain structure. Requires-qualifying livestock - Production in legal area and with technology (e.g. ABC program below).
- **PROTECTED AREAS:** Lack of economic alternatives. Seen as an impediment to development in some sectors. Lack of assets / investments for implementation and sustainable management. Society needs to view the value of environmental services. Fragile in front of economic interests, as has happened in the Tapajós where 5 UCs had their boundaries redefined in order to hydropower project can be implemented.
- **AGRICULTURE:** enhancing the role of the product in the market (soybeans, for example), not the producer. Technical assistance historically poor (currently ATER).
- **FAMILY AGRICULTURE:** dominant agricultural technology: cutting and burning. Each decaying over time in some regions (as in Itaituba, for example).
- **BIOFUELS:** Oil palm expansion in Para. Grains advancing on degraded pastures.
- **TOURISM:** important and potential activity, but with infrastructure problems and high costs.

#### *1.7.1.4 Institutional context*

- Advancement within the legal frameworks in the environmental area in the first decade of the 20th century (creation of the National System of Conservation Units, PPCDAM, Forest Service, TerraLegal, etc.).
- At the national level, the Northern region has little political clout to discuss policies.
- Exacerbation of conflicts between farmers and indigenes for land (Raposa Serra do Sol, Mato Grosso, Apuí)
- Plan ABC (Low Carbon Agriculture) and National Climate Change Plan (voluntary targets for emission reduction).
- Reducing deforestation in the Amazon was a response to global pressure on the carbon problem, but until when? Food security problem can supplant issue of global warming and biodiversity? And if deforestation continues low will the social issues be resolved?
- Role of the market:
- Market pressure consumers for products not related to practices harmful to the environment and society (certifications, moratoria)
- Model development at a crossroads: the market solutions in contrast to greater social control and other actions.
- Clash of different cultures and traditions: Should Indians, for example, be forced to take up the consumer/market model?
- PAC: Economic focus, growth, not social development. For example, no PAC for river transport for the people.
- 92 dams and thousands of PCH without plans / legislation for post-deployment phase and without locks, which makes water transport (logistics for economic activities and populations)
- Weakening of environmental legislation to facilitate large projects (pressure of the productive sector).

- Absence of the state in municipalities that receive large enterprises.
- Many of the basic infrastructure works made by mining companies, for example.

## **I.7.2 Annex 2. Scenario A: Sustainability**

### *I.7.2.1 Vision in 2050*

#### *Natural Resources*

- Remnant vegetation cover of 80%.
- Illegal deforestation zero (<1000 km<sup>2</sup> per year).
- Secondary forest occupying restored areas (legal reserves and permanent).
- Ecological corridors linking private and public forest reserves.
- Adaptation and mitigation to climate change.
- Indigenous lands regularized and protected, PNGATI (National Policy of Territorial and Environmental Management of Brazilian Indigenous Lands) implemented
- Not silted rivers, and preserved aquatic connectivity kept riparian zones.
- Integrated management of territories / basins.
- Extensive use of natural resources for different purposes in a sustainable manner and by different actors (agroforestry and agroecological systems, agro ecology).
- UC (Integrated Sustainable Use and Protection) and Settlement Projects of Sustainable Use fully implemented with management plans that ensure livelihood of populations. Changes in the category of some units may occur, keeping, however, the sustainable character of the area (e.g., creation of projects Sustainable Settlements), and ensuring land security of the people, for example, in areas affected by projects.
- Expansion of protected network areas through the creation of voluntary private reserves.

#### *Social development*

- Interconnected cities with necessary infrastructure.
- Network of services and education appropriate to cover the demands of sustainability.
- Inclusion in rural and urban areas, reduction of inequality.
- Differentiation of man from the country / city, small or large farmer will make less sense. Living in the countryside or in the city is a matter of choice.
- Reversal of rural exodus, due to the distribution of network of services and opportunities (including leisure).
- Technician jobs in the areas of livestock, biotechnology and services.
- Settlements with structured management, relocated to peri-urban areas in order to supply demand for food in the cities.
- Communication, infrastructure and technologies aimed at the welfare of the population.
- Diversified local economies (medium centres) with post-deployment opportunities for large projects.
- Medium-sized cities with integrated urban and rural planning (integrated management of territories).

#### *Economic activities*

- Efficient transportation system, but implemented in accordance with a plan to minimize their social and environmental impacts (including long term).
- Mining activity of great economic importance in the Amazon (enormous wealth of mineral deposits), practiced a sustainable manner with large returns to society.

- Industrial Park - deployed and decentralized, with particular emphasis in biotechnology, among others.
- Low Carbon Farming widely practiced.
- Agro pastoral systems in previously degraded areas.
- Sustainable forest management for timber and non-timber, with structured supply chains (timber medium term).
- Legal Biodiversity reserves being explored.
- Technical assistance for easy access to small and large producers.
- Planning for major projects (energy, mining) in order to avoid boom-bust economies of the cities.
- Diversified local economies (medium centres)
- Tourism as well structured activity
- Livestock: (a) high technology, developed in half of the area currently occupied with transforming forms of absorption of labour (highly skilled); (b) 50% for export; c) intensified with the adoption of technologies with economic and environmental sustainability; (d) increased global production in absolute terms, but lower consumption per capita; (e) Large cattle breeder of the future will be the farmer. Integration enables livestock (ABC Plan); (f) investment in realignment for the farmers to migrate to more sustainable practices.

#### *Institutional context*

- Renewed social contract: access to the rights provided for in the legal framework, including respect for individuals and communities, which allows the city and country there is quality of life.
- Consolidated monitoring systems started in PPCDAM.
- Tenure and complete environmental control with fully operational systems.
- RESEX and other protected areas consolidated from the rational use of natural resources / in a sustainable manner (in all dimensions, in especially social).
- Territorial planning instruments (ZEE, master plans, etc.). Implemented and operational, following the guidelines mandatory revisions (Law).
- Existence and effectiveness of new instruments for assessing social and environmental impacts of works and projects beyond the EIA-RIMA.
- Centres of education and research to local people, focused on the use of natural resources, development of new technologies and new ventures.

#### *I.7.2.2 Pathway*

##### *Natural resources*

###### Short-term actions:

- Increased surveillance - C (IBAMA; ICMBIO; SEMAS; SEMMAS; DPF; FNS; environmental police, FUNAI).
- Facilitation of access to credit, especially for family farms - C (MF; FINANCIAL AGENTS; NGOs).

###### Short / medium term actions:

- Strengthening of land management / environmental - use of instruments such ZEE, master plans, CAR, UCs management plans, TIs management plans, plans for basins PRADA (recovery plan degraded or altered areas) - C / M (executive powers of each instance; NGOs).
- Compliance with the Brazilian Forest Code - C / M (IBAMA; SEMAS; SEMMAS; DPF; FNS; environmental police, FUNAI)

- Implementation of training and environmental education programs - C / M (NGOs; SEMA; SEMMA, MMA, MDA).
- Incentive for forest restoration at a landscape level (ecological corridors) - C / M (FBS; SEMA; MMA; SAGRI; NGOs).

Short / medium and long term actions:

- Strengthening institutional governance (all levels) - C / M / L (Strengthening the democratic rule of law).
- Valuation of primary and secondary forests through implementation of PSA programs and integration with SAF, respectively - C / M / L (SAGRI; EMBRAPA; SEMA, MAP; SFB; NGOs; MMA).

### *Social development*

Short term actions:

- Integration between different policy sectors (green purse, My House My Life etc. and incentives for the production) in territorial bases, following the criteria of the zoning.
- Adequacy of social and territorial policies management to local realities (agendas, customs and practices of populations).
- Use of local knowledge and traditional knowledge in formulating training and technical assistance programs.
- Qualification, training and technical assistance activities aimed not only for agricultural but also for new urban markets and segments (courses etc.).
- Reform of police and public security institutions, with increased rates of condemnation for violations of the law and ending impunity.
- Organization and revitalization of urban space for better social integration and alternatives for youth (plazas, sports facilities, schools, etc.).
- Reform of the Judiciary.
- Improvement of border surveillance.
- Guarantee of land rights for traditional communities.
- Enhancement of corporate social responsibility in large projects.
- Enhancing the use of royalties by public authorities, with citizen participation

.Medium term actions :( 2015-2025)

- Use of local knowledge and traditional knowledge in formulating training and technical assistance programs.
- Qualification, training and technical assistance activities aimed not only for agricultural but also for new urban markets and segments (courses etc.).
- Design and implementation of new educational policy

Short / medium term actions:

- Organization of the productive chains, focusing on local agricultural production for supplying large enterprises in the Amazon.

Short / medium and long term actions:

- Investing in technological procedures whit use of biodiversity

Medium and long term actions:

- Institutional reform and consolidation of the rule of law
- Disappearance of inequalities in access to citizenship

### *Economic activities*

Short term actions:

Transport

- Preparation of Master Plan (Federal, State and Municipal)
- Finalizing National Logistics and Transport Plan (EPL)
- Talk about efficient use of fuels (Ministry of Transport, Ministry of Environment).

#### Mining

- Reviewing Clearing Plans, considered unsatisfactory (Ministry of Mines and Energy, Ministry of Environment).
- Study ways of adding value through technology adoption and market development (Ministry of Mines and Energy, Ministry of Science and Technology; Ministry of Foreign Affairs).
- Training miners and restraining illegal and predatory exploitation in the mines.

#### Biotechnology industrial park

- Preparation of plan that will change the current situation, based on isolated initiatives.

#### Low Carbon Agriculture

- Implementation of ABC plan.

#### Technical assistance

- Increasing the number of technicians.
- Enlargement of networks and telecenters in order to facilitate distance education.

#### Agroecology system

- Discussion and deployment planning

#### Livestock

- Early work focused on small livestock and modifying negative image of livestock (Ministry of Agriculture and pastoralists civil society organizations).

#### Tourism

- Elaboration and discussion of National Tourism Plan, aiming structuring of models: sustainable tourism whit community-based Amazon.

#### Medium term actions:

##### Transport

- Master Plan implemented with EIA / RIMA (Federal, State and Municipal)
- Waterway transportation (EPL)
- Efficient use of planned fuel (Ministry of Transport, Ministry of Environment), with integrated action between ministries for implementation.

##### Mining

- Compensation Plans including legislation, technology, education and adequate monitoring (Ministry of Mines and Energy, Ministry of Environment).
- Vertical integration of production, including construction of the production chain in the Amazon (Ministry of Mines and Energy, Ministry of Science and Technology; Ministry of Foreign Affairs).

##### Biotechnology industrial park

- Skilled local community
- Research and extended application
- University and community integrated into market

##### Low Carbon Agriculture

- Entrepreneurial culture realigned according to ABC Plan

##### Technical assistance

- Technical Assistance - greater geographic footprint and close proximity of activities
- Capacity building and expanded global access to internet

##### Agroecology system

- Occupying 10% of deforested areas through investments ABC Plan (Ministry of Agriculture)

##### Livestock

- Production only in legal area and with technology
- Recognition of the role of farmer and cultural change to/cattle breeder

- Diversification of production for the advancement of aquaculture and small animals.
- Encourage small / medium / large integration (State as mediator)
- Adoption of tripartite councils to discuss issues related to the different supply chains.
- Greater integration / coordination with neighbouring countries.

#### Extreme events

- Development of forecasting and risk management system

#### Forest Management (multiple use)

- Mapping and certification of projects and forest products (Brazilian Forest Service, ICMBio)
- Structuring of the production chain
- Exploration of the legal reserve areas (private property)
- Stimulating research and innovation which explore use of biodiversity

#### Planning of major projects

- Compatibility between projects and goals of Conservation Units and Indigenous Lands, so that they begin to consider the specifics of the areas where there are Tis and UCs.

#### Tourism

- Continuity of the National Tourism Plan actions: training; adoption of policies without competition between states (packages cooperation); strengthening of sustainable and community-based tourism; transforming potential for products (infrastructure, cost, etc.); fishing tourism: legislation strengthening.

#### Institution (General)

- Enlargement of the management capacity of municipalities (training).
- Environmental licensing revision.
- Integration of actions with neighbouring countries in different sectors
- Ensuring that basic environmental plans of ventures in the region are fulfilled, and systematically monitored.

#### Long term actions:

##### Transport

- National Plan for Logistics and Transportation implemented with sustainability criteria (EPL)
- Pan -Amazonian integration completed.

##### Mining

- Production sustainable and verticalised.

##### Biotechnology industrial park

- Implemented.

##### Low carbon Agriculture

- Implemented.

##### Technical assistance

- Extensive use of IT in order to subsidize and modernize technical assistance

##### Agroecology system

- Occupying 20% of deforested areas through ABC Plan investments (Ministry of Agriculture).

##### Livestock

- Consolidated as a major use of the land, but uncertainty regarding the percentage of occupied deforested area. (check demand: CNA) -% of future occupation:
- Uncertainty: livestock wide and intensive (sustainable livestock confined or extensive). Cost containment is high in the Amazon. Containment out of AM.

#### Extreme events

- Forecasting and risk management system implemented.

Forest Management (multiple use)

- Consolidated

Planning of major projects

- Consolidated and without conflicts

Tourism

- Amazon as a top tourist destination
- Integration with other countries in the Amazon region circuit with other destinations in Latin America, the Pantanal

Institutional context

- Enlargement of the management capacity of municipalities (capacity building).
- Implement measures necessary to enable effective access to rights provided in the legal framework (renewal of the Social Contract).
- Consolidation of monitoring systems started in PPCDAM
- Complete land and environmental regulation
- Integration of actions with neighbouring countries in different sectors in different dimensions (environmental, economic, social).
- Maintain operations and improve control systems.
- Consolidate RESEX and further protected areas starting with rational use of natural resources/sustainable use (in all dimensions, particularly social).
- Operationalize spatial planning instruments (ZEE, master plans, etc.) following the guidelines mandatory revisions (Law).
- Operationalize and implement new tools for assessing social and environmental impacts of works and projects beyond the EIA-RIMA.
- Create and strengthen research and education centres for local people, focused on the use of natural resources, development of new technologies and new ventures.

### **I.7.3 Annex 3. Scenario C: Chaos and fragmentation**

#### *I.7.3.1 Vision in 2050*

##### *Natural resources*

- Total deforested area would reach 30-40%.
- Degraded forest fragment without biological corridors, ecological functions compromised.
- Extensive use of natural resources in indigenous lands and conservation units.
- Unsustainable use of forest, water, mineral and soil resources.
- Evidence of climate change increasing.
- Inadequate forestry (with concession or not).
- Compromised availability and quality of surface and underground water.
- Compromised air quality.
- Dependence on fossil fuels; lack of implementation of alternative energy sources
- Disorderly expansion of hydropower plants and absence of effective environmental compensation
- Agricultural production based on unsustainable practices
- Impoverishment of forests ("savannisation"), with increased susceptibility to fire.
- Climate change, rising extreme events affecting food availability.
- Loss of biodiversity.
- Reducing of protected areas, too.

##### *Social development*

- Total deforested area would reach 30-40%.
- Social Degradation (drugs, violence, etc..).
- Unemployment / informal employment.
- Insecurity of basic services (health, education, infrastructure, security).
- Increased property conflicts.
- Increased rural exodus.
- Breakdown of lifestyle (reproduction) of the communities.
- Fragility of communities with respect to developments and consequent economic dependence.
- Conflicts between borders.
- Epidemics.
- Lack of social programs
- Increase of slumming of cities and inequalities

##### *Economic activities*

- Economy oriented to the international market (monocultures, commodities).
- Low land value (off the market and no land control).
- Wood demand supplied mostly by reforestation.
- Unsustainable forest management, but limited; timber sector has little expression, occupying some niche of wood from native trees market.
- Contamination of genetic materials.
- Global Inflation
- Increased informal mining activities (illegal mines, extraction of sand, irregular pebble, etc.).
- Predatory mineral activity

### *Institutional context*

- Regulatory frameworks favouring economic interests at the expense of social and environmental.
- Destructuring of organizations / institutions.
- Strong presence of narco-trafficking due to this disruption.
- High levels of corruption.
- Fragmentation of states and consequent pressure on forest areas.
- Absence of mitigation measures and adaptation to climate change.
- Internationalization of the Amazon.
- Fragility of security / sovereignty of borders.
- Conflicts at borders.

### *1.7.3.2 Pathway*

#### *Natural resources*

##### Short term actions:

- Deficient and inadequate supervision - C (IBAMA; ICMBIO; SEMAD; SEMMAS; DRF; FNS; environmental police, FUNAI).
- Credit lines unconnected to environmental policies (environmental ballast) and absence / lack of credit to agriculture family - C (MF; FINANCIAL AGENTS; NGOs)

##### Short / medium term actions:

- Focus on development policies without environmental protection - C / M (MAP; MDA; ANATER; SAGRI; specific State agencies).
- Lack of stimulation for traditional modes of use and management of biodiversity - C / M (FBS; SEMA; MMA; IBAMA; FUNAI; ICMBIO; NGOs).
- Inadequacy and / or lack of territorial / environmental management (such as ZEE, master plans, CAR, UCs management plans, Tis management plans, river basin plans) - C / M (Executive powers of each instance; NGOs).
- Absence and / or lack of training and environmental education programs - C / M (NGOs; SEMA; SEMMA, MMA, MDA).
- Change of land use which triggers the increase of forest fragmentation - C / M (FBS; SEMA; MMA; SAGRI; NGOs).

##### Medium term actions:

- Noncompliance forest code – M (MMA; IBAMA; MP; SEMA; INCRA)
- Exploitation of water resources beyond the capacity, change of the dynamics of a river basins and water pollution - M (ANA; STATE AGENCIES FOR WATER RESOURCES; CNRH; ASSOCIATIONS LOCAL)
- Absence of plans and actions focused on mitigation and adaptation to climate change - M / L (MMA; SEMA, MAPA; MCTI).

##### Short / medium and long term actions:

- Discontinuity of monitoring systems - C / M / L (INPE; IBAMA; SEMA; NGOs; SIPAM).
- Continuing unsustainable practices in agriculture production systems - C / M / L (EMBRAPA; UNIVERSITIES; AGENCIES FOR STATE RESEARCH - SNPA, MAP).
- Institutional weakness (in every sphere) - C / M / L (Strengthening the democratic rule of law)
- Elimination of secondary forests for charcoal production and implementation of agricultural systems - C / M / L (SAGRI; EMBRAPA; SEMA, MAPA; SFB; NGOs; MMA).
- Absence of policies encouraging sustainable activities.

- Excessive appreciation of timber forest resources.

#### *Social development*

Short term actions: (Agents: State, Private Sector, NGOs)

- Credits and abundant tax incentives for agro-export model based on the extensive use of natural resources in the Amazon.
- Prioritization of energy production for the industrial and mining activity in the region as unique vocation
- Decommissioning of monitoring systems of using natural resources.
- Liberalization of territorial employment without concern for the regularization and the ZEE
- Dismantling of INCRA, IBAMA, FUNAI and ICMBio.
- Dismantling / extinction of the SNUC.
- Indian acculturation as social inclusion policy.
- Use of cities (and standardized housing programs) for creating pools of underemployed workers
- Maintenance of standardization in public policies, without considering culture and local characteristics for housing construction.
- Lack of measures to address the issue of access to water in human settlements.

Medium and long term actions :( Agents: State, Private Sector, NGOs)

- Deepening of Developmental Model for the region.
- Maintenance of unequal access to citizenship and income.

#### *Economic activities*

- Only Command and Control PPCDAM axis kept
- Transport infrastructure - No planning and without prepared Master Plan.
- Lack of discussion about an effective transportation solution for urban areas
- Inefficient circulation of people, goods and services
- No land tenure regularization - unmanaged and with no governance.
- No precautionary measures in relation to climate change and natural disasters.
- Radicalization, sectarianism, conflict.
- Intensification of differences between capitalistic /development model and social demands.

#### *Institutional context*

Short / medium term actions:

- Easing of legal frameworks (social and environmental)

## PART II – STAKEHOLDER WORKSHOP IN EUROPE

### II.1. Introduction

Stakeholder participation is a crucial aspect of AMAZALERT, particularly related to the issue of (scenarios for) deforestation and land use change. Crucial is the combination of exploring plausible future outlooks and discussing potential policies and strategies to reduce deforestation.

Socioeconomic scenarios were developed in order to explore a range of socioeconomic, political, and institutional drivers of deforestation and a set of plausible future outlooks of land use change in the Brazilian Amazon. These can then be used to discuss robust policies to slow deforestation. With this in mind, a series of three workshops was designed and executed.

The purpose of this part of the Deliverable is to provide an overview of the main methods and results related to the third and last in a series of stakeholder workshops conducted within the AMAZALERT project. Two earlier workshops were conducted in Brazil that yielded a number of products related to future outlooks for the Brazilian Amazon in 2050, including qualitative stories, quantitative (land use) model results, and lists of policies and other actions that would need to be undertaken to decrease deforestation (see Part I). From the results, it was concluded that Brazil is firmly embedded in an international and global setting, where manifold outside forces could influence Amazonian policy making and deforestation. It was therefore decided to organise a third workshop in Europe, in order to discuss the broader setting of Brazilian deforestation, and particularly the potential role of the European Union to influence it. This part is a short version of a longer and more complete report of the workshop's methods and results, which is available upon request<sup>4</sup>.

#### II.1.2 Objectives of third workshop

A one-day workshop was organised in Brussels on 11 December 2013. The workshop's main objectives were:

- **Dissemination.** Presenting and discussing an overview of the main results of the project and of the first two workshops was seen as essential, mostly because AMAZALERT was in its final stage and results were available.
- **List and discuss European (“no-regret”) policies.** Assess the current situation of policies and other initiatives in Europe to stop deforestation in the Amazon. Discuss possible policies and other actions that could be successful under various scenarios, i.e. no-regret policies.

The second objective was reached with three sub-objectives:

1. **Discuss current policies and their impacts.** Stakeholders were asked to draw the current policies and other initiatives from within Europe that targeted deforestation in the Amazon, and their impact. This activity served to establish the perception of the participants on the current situation.
2. **Discuss plausible future policies.** Stakeholders were asked to discuss possibilities to reduce deforestation in the Amazon by identifying policies from within Europe and their impact, building on the first activity. These policies were scenario-specific as two groups were given a contextual future outlook that predefined a number of global and European developments beyond the control of the participants.
3. **Identify potential no-regret policies.** Policies resulting from two scenario-specific contexts were compared and a list that would work in both scenarios, i.e. no-regret policies, was drafted.

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<sup>4</sup> The report is not part of any Deliverable of the AMAZALERT project and will therefore not be available from the project's website. A copy can be obtained by contacting Kasper Kok (kasper.kok@wur.nl).

### II.1.3 Structure of report

The report is divided into two main parts. The first part includes Section 2 and 3 and describes the methods that were used (Section 2) and provides an overview of the main results that were obtained during the workshop (Section 3). The second part includes Section 4 and 5 and describes the post-workshop analysis by AMAZALERT scientists of the results in terms of policy robustness (Section 4) followed by an overall discussion and conclusion (Section 5).

## II.2. Workshop methodology

### II.2.1 Agenda

The final programme of the workshop was drafted after consultations with a number of project partners (see Table 1). The morning was reserved for dissemination of project results and an initial discussion on current policies, while it was planned to spend the afternoon discussing future outlooks and policies for two distinctly different scenarios. Figure 1-4 provide an impression of the participants and the work executed.

Table 1. Agenda of workshop

Time	Activity
8:45-9:10	Registration and welcome
9:10-9:30	Participant introduction
9:30-11:00	<b>First objective: Dissemination (AMAZALERT-wide).</b> Presentations on background and results of AMAZALERT, land use modelling in Brazil, and policies in the Amazon.
11:00-12:30	<b>Second objective: Current policies.</b> Break-out groups; session I. Central question: What is the current role of European policies and other actions related to deforestation in the Brazilian Amazon?
12:30-13:30	Lunch
13:30-14:00	Introduction to European and Brazilian scenarios
14:00-15:30	<b>Second objective: Future policies.</b> Break-out groups; session II. What future policies and other actions are needed to contribute towards the goal of reducing deforestation?
15:30-17:00	<b>Second objective: No-regret policies.</b> Plenary reporting back and discussion on robust policy options <sup>1</sup>
17:00-17:15	Conclusions and next steps

<sup>1</sup>: The planned discussion on robust policy options did not take place during the actual workshop (see section 2.5)

## II.2.2 Stakeholder selection

A mixture of stakeholders was selected that had both relevant expertise on the impact of Europe on Amazon deforestation and the ability to influence policy and practice. In principle, we drew from four main stakeholder categories: Policy makers, scientists, environmental NGOs, and businesses. Additionally, we invited a small number of participants from the first workshops in Brazil to take part.



Figure 1. Workshop participants listening to presentations

## II.2.3 Dissemination - Presentations

Dissemination revolved around those aspects of AMAZALERT that directly related to deforestation in the Amazon. Short presentations covered the background of AMAZALERT and results until December 2013 including socioeconomic scenarios, land use modelling in Brazil, and policies in the Amazon and Europe. Presentations were followed by discussions. Topics included:

- Welcome and introduction of DG R&I (Marco Gemmer, Project Officer European Commission)
- Overview of main intermediate results of AMAZALERT (Bart Kruijt, Project coordinator)
- New insights on Brazilian deforestation: the Brazilian Perspective (Arnaldo Carneiro, stakeholder WS1 and WS2)
- Introduction to scenario method and scenarios as developed in WS1 and WS2 (Kasper Kok, scenario-expert AMAZALERT)
- Overview of Brazilian policies related to deforestation. (Mateus Batistella, Director, EMBRAPA Satellite Monitoring, Brazil)
- Overview European policies potentially having an impact on Amazon deforestation (Dorian Frieden, policy expert AMAZALERT)

Presentations will be made available online<sup>5</sup>. The content will not be elaborated upon in this report.



Figure 2. Discussions in break-out group 2 on current policies

#### **II.2.4 Current policies – Mindmapping**

A mind map is a diagram used to visually organise information. A mind map is often created around a single concept – like deforestation –, drawn as an image or in key words in the centre of a blank landscape page, to which associated representations of ideas such as images, words or parts of words are added. Mindmapping was selected as the method to employ as it provides the opportunity for in-depth knowledge sharing between participants and researchers alike, while yielding structured outcomes with documented relationships between main factors and policies.

The activity took place with participants gathered around a table on which the mindmap was constructed. Participants were facilitated to brainstorm features of European policy and behaviour that impact upon deforestation of the Amazon, to explore the mechanisms through which these impacts occur, and to represent these relationships by arrows between items on the mindmap. The activity involved a facilitated discussion between participants about the relationships between European policy and Amazon deforestation and the role that Europe could play in reducing Amazon deforestation.

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<sup>5</sup> Presentations will be available shortly after November 30, 2014 on the AMALAERT website ([www.eu-amalalert.org](http://www.eu-amalalert.org)).



Figure 3. Construction of mindmap in break-out group 2.

## II.2.5 Future policies and strategies - Backcasting

### II.2.5.1 Scenarios: general purpose and method

The highly complex global interrelationships between social, environmental, political and economic issues mean that the future is often impossible to predict. We cannot afford to make strategies on how to tackle issues such as deforestation without examining the underlying assumptions that were made on what the future will be like. The success of any strategy or policy depends on the context for which it has been developed; if that context changes, so does the usefulness of the plan.

The use of scenarios allows groups of planners and decision makers to explore diverse, plausible (which means believable and consistent) futures and what challenges and opportunities they may pose to plans and actions. A scenario set is often a set of diverse narratives (in words, numbers, images) about the future. Each scenario represents a future that is very different from the others in the set. Scenarios offer a tool for the integration of different types of information and have been reported to increase systems thinking in those who develop or use the scenarios.

#### *Robustness testing:*

Important in the context of this workshop is the ability to use scenarios to test the robustness of strategies. Using a diverse set of scenarios ensures that a number of distinctly different futures are included. As a second step, scenario-specific strategies can be discussed, in this case to reach zero-deforestation in the Amazon. These sets of scenario-specific plans can then be compared. Elements that are common to all scenario-specific sets can be considered “robust” in the sense that they would be successful in any future that might unfold. Seeing scenarios as a tool for testing plans is key – just like a car is not just tested on a smooth road but under extreme conditions, scenarios provide extreme futures to see whether plans hold up under such conditions. Several sets of global and European scenarios have been developed over the past two decades within important initiatives



### II.2.5.2 Contextual scenarios

For the purpose of this workshop, we used the GEO-4 scenarios as context, mostly because they have a global and a European version, which makes them particularly suitable for discussing European effects on Amazon ecosystems. Figure 5 illustrates the four GEO-4 scenarios with four cartoons.

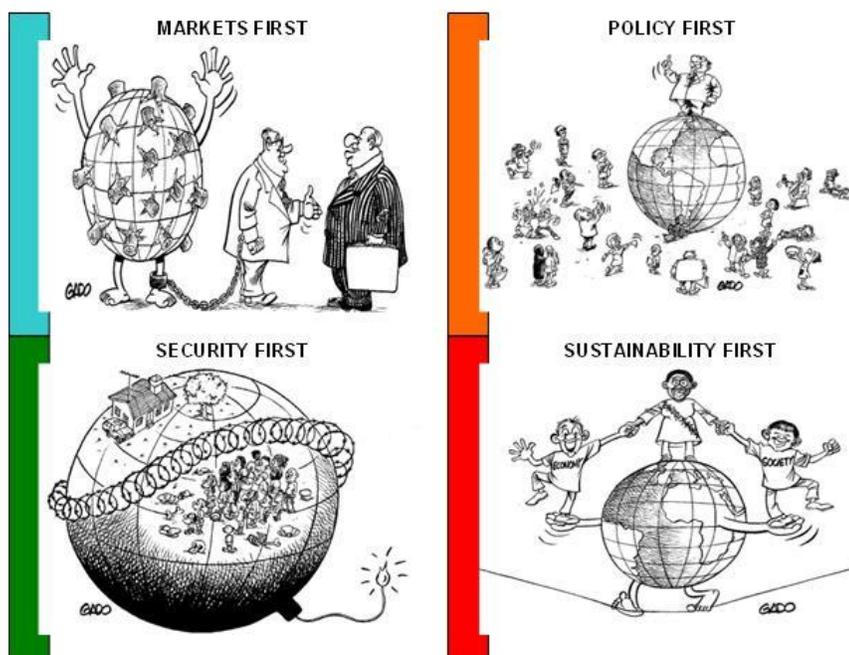


Figure 5. The four GEO-4 Scenarios.

Of those four scenarios, two were selected to be used by the two break-out groups.

*Security First:* The world becomes increasingly unstable due to a number of crises, which causes instability and an increase in terrorism across Europe. This leads to an increased exploitation and strict management of domestic natural resources, paying less attention to environmental consequences. The gap between the rich and poor countries widens, yet the EU survives.

*Sustainability First:* The main long-term changes towards 2050 include a transition towards environmental sustainability, in which the landscape has become the basic unit. The overall focus is on quality of life rather than economic indicators through local diversity which is governed by local networks. This transition to local sustainability is the result of a long-term process that starts with a set of strong top-down measures, and which is later accompanied by behavioural change and a new governance structure.

### 2.5.3 Backcasting

This activity was conducted in the same two breakout groups as in the first phase. Using the mind map from the previous activity as an object to stimulate discussion and focus thinking, participants were asked to brainstorm on strategies and policies which Europe could implement in order to minimise Amazon deforestation both by limiting its own negative impacts and exerting positive pressures. A backcasting approach was followed that started with the identification of a desirable end-point and intermediate milestones, and was followed by a backward reasoning from the end-

point to a set of concrete actions needed to reach objectives, accounting for obstacles and opportunities as presented by the contextual scenario. Beforehand, possible desirable end-points were discussed and the following end-point was agreed upon to use as a first proposal:

*Zero/strongly reduced deforestation and degradation in 2050 in the Amazon*

Both mindmapping and backcasting were conducted in two breakout groups of about 5-10 participants. The same two groups were maintained in the morning sessions and in the afternoon scenario-specific sessions. The main logic to opt for more than one group was that by splitting we would quickly generate more information than in a single plenary session.

#### *II.2.5.4 Robust policies*

The original agenda included a comparison between the main strategy lines and a discussion on the robustness of the strategies that emerged from both groups. Unfortunately, as the day drew to an end, a number of participants had to leave. In order to keep the workshop's outcomes as much as possible a product of all participants, we concluded the day with both groups presenting the results of the backcasting session to each other. A summary of the main strategy lines and actions that emerged from the two groups and an analysis of similarities and differences, and thus robustness of strategy lines, was conducted *a posteriori* by AMAZALERT project members.

## II.3. Workshop results

### II.3.1 Current impacts and policies

#### II.3.1.1 Break-out group 1

Figure 6 shows the mindmap as it was produced during the first session that was to discuss current policies and impacts on deforestation in the Amazon. It is beyond the scope of this report to provide a detailed analysis of all the richness of the product. What follows is a short summary of the main aspects that were discussed.



Figure 6. Current impacts and policies: Mindmap of break-out group 1.

Main aspects (marked in red in Figure 6):

- **EU consumers – food demand.** Participants agreed that there is a relatively large role for European consumers as they link to food and wood demand through their influence on global markets.
- **Forest trade and investment.** Participants identified trade in forest products as another main component in the discussion around deforestation.
- **Energy.** Participants agreed that the energy sector (biofuels) was an important factor, mostly through the current Renewable Energy directive.

Other important aspects:

- **EU policies.** An item discussed at great length throughout the session was the identification of current EU policies and their impact. A long discussion took place that covered many existing policies. Participants, in general, agreed that the current direct impact of EU-level policies is limited. The Common Agricultural Policy, for example, was singled out as a key policy instrument, currently of little influence on deforestation.

- **Economic growth.** Participants discussed at some length the role of economic development and how a “different model of development” might be needed to decrease the current impact of economic growth.

Important insights from the group included:

- **Social aspects are becoming increasingly important as driving forces.** This is represented by the consumption issue in the EU and by socio-economic targets that have been set for fulfilling certain regional needs in the Amazon.
- **The EU cannot do it alone.** The EU is by far not the only international player with influence on the Amazon. The EU should deal with the role of its policies at the global level.

In short, the influence of EU policies on the Amazon mainly acts via the sectors EU consumption, trade and investment, technical cooperation and EU directives. Among these sectors, impacts emerge from timber trade, food supply and the EU Renewable Energy directive that have been identified as main drivers of deforestation. Especially “food” (including EU consumption of agricultural products on the one hand, and European subsidies in the agricultural sector on the other) was highlighted as one of the main driving forces; as for the consumption patterns (market behaviour), the role of certification and awareness raising have been highlighted. Additionally, but clearly secondary, “wood” was earmarked as important, again mostly through market mechanisms.

#### *II.3.1.2 Break-out group 2*

The group agreed that Europe affects the Amazon directly in terms of consumption behaviour, trade agreements and standards, and indirectly through setting an example and applying pressure. The group found it was easier to talk about what Europe was not doing in terms of managing its impacts than what it was doing. Accordingly the group listed the things that Europe was not doing or could do more of and therefore effectively jumped immediately to the response exercise. The results of their activity are summarized below and demonstrated in Figure 7 and 8.



Figure 7. Current impacts and policies: Excerpt of mind map created by break-out group 2. Overview.



Figure 8. Current impacts and policies: Excerpt of mind map created by break-out group 2. Detail.

A major discussion line was that the EU's direct impact on deforestation is relatively small as compared to major importers such as China. The EU demand for forest products has low impact on forests in Brazil as the big majority of products are consumed in Brazil or exported to Asia. An expansion of forest plantations for export could however potentially emerge. Due to the currently perceived limited direct impact of the EU, Europe should act at the international scale (e.g. WTO, FTAs).

Specific (EU) standards on trade and imports could address bioenergy and soy. Support criteria for REDD projects in compliance with local/reciprocal arrangements and the risk of "backfiring" when REDD programs are badly designed were discussed (Risk of "good intentions"). Norway, Germany, UK and the Netherlands were specifically mentioned in the context of REDD.

European trade should go beyond satisfying its own demand and should be more broadly engaged. Specific rules for ethical company behaviour were discussed and covered policies governing TNCs (trans-national companies) and their investments, the establishment of a baseline for importing based on forest law compliance.

Regional cooperation, between Amazon countries and between Latin America and Europe, and dialogue should be fostered including hosting and enhancing dialogues on experiences of regional sustainable development, trans-border cooperation on institution building, and support of international and national efforts such as REDD and FLEGT both financially and in terms of expertise. In terms of technical cooperation, addressing agricultural planning and development, environmental planning, sustainable infrastructure, land use/landscape planning and forest conservation were mentioned. A lack of focus on social benefits/innovations of domestic production systems was mentioned. Fostering social inclusion and pro poor action could include the development of a small scale forest sector (native species) near to demand in Brazil, and a support of community banks, economies and products. The current policy was perceived as distorting farming in terms of large scale producers.

A last main discussion line referred to the EU internal sustainability and its magnitude of demand for imports which impacts global markets. Here the EU could set an example by attempting to reduce demand for products that are less sustainable. A lack of policies addressing the overall consumption in Europe (except for energy) as well as a lack of policy cohesiveness was pointed out. Besides reducing the overall consumption/increasing efficiency, the balance of domestic production and imports could be addressed (CAP). The role of the civil society for improving internal sustainability was mentioned.

#### *II.3.1.3 Communalities between break-out groups*

Looking at the results from both break-out groups, there is an apparent and rather large overlap in the issues that were addressed. Generally, speaking, two main elements stand out: Firstly, the current impact of EU policies as well as EU consumption is (very) limited. Secondly, issues to be discussed, therefore, needed to revolve around the lack of policies rather than current presence. Among those, both groups identified the following aspects as having potential to increase the impact of the EU on the deforestation issue:

1. **Enhanced (regional) cooperation.** This broad category refers to cooperation between Amazon countries, between Brazil and the EU, and within Brazil between the different states. It includes cross-border cooperation, EU-national-local collaborations, and cross-sectoral collaboration. Cornerstones for a successful collaboration are increased transparency (of internal Brazilian and EU policies) and enhanced knowledge transfer (between Brazil and the EU).



#### Important Milestones:

- **Institutional transparency increased.** This includes better information and better information provision, protocols to increase traceability, and new international agreements. Concrete elements are the definition and application of precise criteria for decisions and sanction setting in cases of non-adherence to demonstrate the credibility of control systems.
- **New cross-sectoral international policies developed.** Directives, actions, and agreements become policies that can and will be enforced. This includes that criteria are applied, and sanctions are agreed and enforced.
- **Sustainability criteria for investments defined and applied.** Crucial is an early agreement on what criteria need to be enforced, followed by the actual application around 2030.

#### Important actions:

There was consensus that deforestation can only be stopped through better policies if many different key actions are taken, some examples of which are given below.

- **Tackling global challenges related to Amazon deforestation,** including combatting climate change; addressing the global phosphate crisis; implementing global treaties on equitable food distribution; and securing payment for environmental services.
- **Strengthening strategic aspects of EU-Amazon cooperation,** including developing an EU deforestation strategy; extending FLEGT to agro and renewable energy; implementing CBD POWPA; and Europe providing adequate and predictable and long term funding.
- **Strengthening strategic issues inside the Amazon,** including supporting the land ownership agreement process; improving the river transportation network; and enhancing local solutions.
- **Intensify knowledge exchange and knowledge transfer,** including cross-border cooperation; cultural and academic exchange; and identifying deforestation frontiers
- **Increase consumer awareness,** including forest impacts; targeted campaigns; and promoting voluntary certification.
- **Explore new markets and engage industries,** including pharmaceutical industries; markets for non-timber forest products; and tourism.

#### Main strategy lines:

Summarising the milestones and key actions, three main strategy lines for the EU were discerned:

1. **Stimulate scientific research** related to environmental sustainability. There was agreement that the EU could invest more in scientific research, which through collaborations and knowledge transfer would help stopping deforestation.
2. **Establish international agreements and ultimately policies.** In line with the overall objective, crucial in the strategy were collaborations, cross-border, cross-scale, and cross-sectoral. These would start relatively informal but with clear criteria, but would quickly (towards 2030) be transformed to strict policies with sanctions and consequences.
3. **Market investments and public awareness.** Much of the discussions in this session and in the previous one revolved around markets, investments, and incentives for companies on the one hand, and public awareness and transparency on the other hand.

#### Other observations:

- It was noted that even if all actions would successfully be implemented and international policies enforced, the impact on deforestation in the Amazon would be limited. A percentage of 25% was mentioned as the influence of Europe.

- A rather large number of the suggested actions were, in fact, largely the responsibility of Brazil and other Latin American countries (e.g. “local solutions”). As such, they need to be treated with care as they could not be directly tied to stakeholders present in the discussion.

### II.3.2.2 Break-out group 2 – Policies in Security First



Figure 10. Future policy options. Results of backcasting exercise of break-out group 1. Overview.

Overview of actions and strategies (see Figure 10 and 11):

The context-scenario for this group was *Security First*, an increasingly unstable world with increased levels of terrorism, which triggers the need for security and resulting focus on market protectionism and an increased gap between poor and rich. This was interpreted as a scenario that presents many obstacles in order to achieve zero deforestation. The end-point was not defined as strictly as in break-out group 1, but kept more general as “zero deforestation in 2050”. Figure 5 shows the results of the backcasting exercise that followed. Below is a summary of the overall ‘storyline’ that was developed that explains how the overall goal could be achieved despite the contextual scenario:

European NGOs offer posts to Chinese nationals developing relationships, cultural exchange and training. A SINO-EU ethical business partnership is set up (“The Club of Good Business”), which invests in protective projects – to conserve forests, but also social, human, and financial capital in the broadest sense – collaboratively in return for improved terms of trade. There is cultural exchange with China through web, TV etc. promoting conservation and social inclusion. Many active civil society movements begin in response to the unequal, unsustainable status quo. These movements gain a great deal of strength. Social media is used to raise awareness globally about grounded realities for the forest and rural poor. Domestic and international interest in sustainability is further built in this way. Brazilian civil society movements channel EU civil society support to build the effectiveness of local movements. Through public pressure stronger policies of command and control for environmental and socio-economic quantities are put in place. There are stronger policies to stop deforestation as well as pro poor agricultural and environmental policies. Bilateral agreements are negotiated to enforce these conditions as the WTO no longer exists in this scenario. Civil society applies pressure for these agreements to also include economic incentives for engagement in social or environmental improvement. Environmental obligations are included in trade conditions.

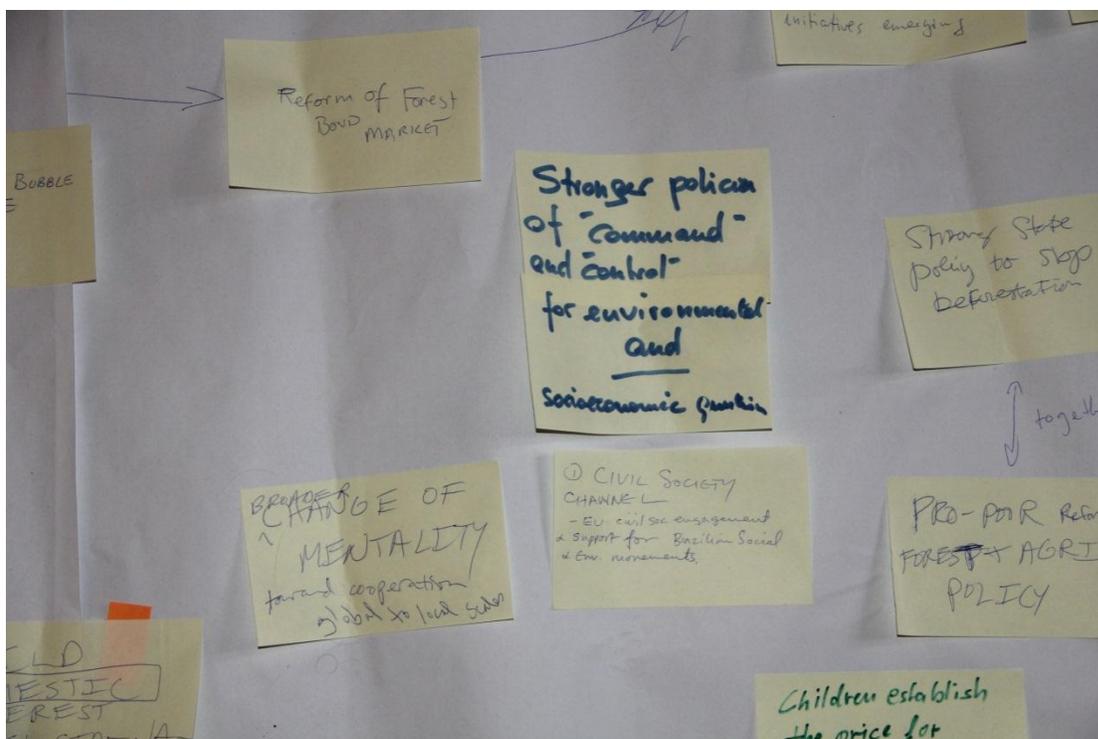


Figure 11. Future policy options. Results of backcasting exercise of break-out group 1. Detail.

Most important newly developed strategies in the afternoon session:

- **Strengthen civil society.** Because of the fragmented nature of governance institutions, civil society played a huge role in establishing the sustainable pathway, through social media and other awareness raising campaigns
- **Incorporation of the cost of harm.** A novel item in the afternoon session was the notion that the costs of harm needed to be included in goods and services.

Strategies that were a continuation from the morning exercise:

- **Education of the next generation.** Education is what in many ways is indispensable to start any other action, and was seen as absolutely crucial.
- **New and strong trade agreements.** Agreements were particularly seen as important with the other BRIC countries, notably China.
- **Europe 'cleans up its own act'.** Despite the strong arguments for collaborations, it was also stressed that this cannot successfully take place without the EU better organising financial, political, and environmental issues at the same time.

### II.3.2.3 An artist's impression

Ms Bridget Currie, a professional artist, attended the afternoon sessions of the workshop and was asked to make impressions of the workshop, in order to produce outcomes in addition to the formal products. As visualisations can be potentially powerful, we asked for images. Figure 12 and 13 give examples of images that were produced to illustrate the inequalities in the *Security First* scenario.



Figure 12. Example of an image drawn by artist during afternoon session of workshop illustrating the inequalities in the *Security First* scenario.

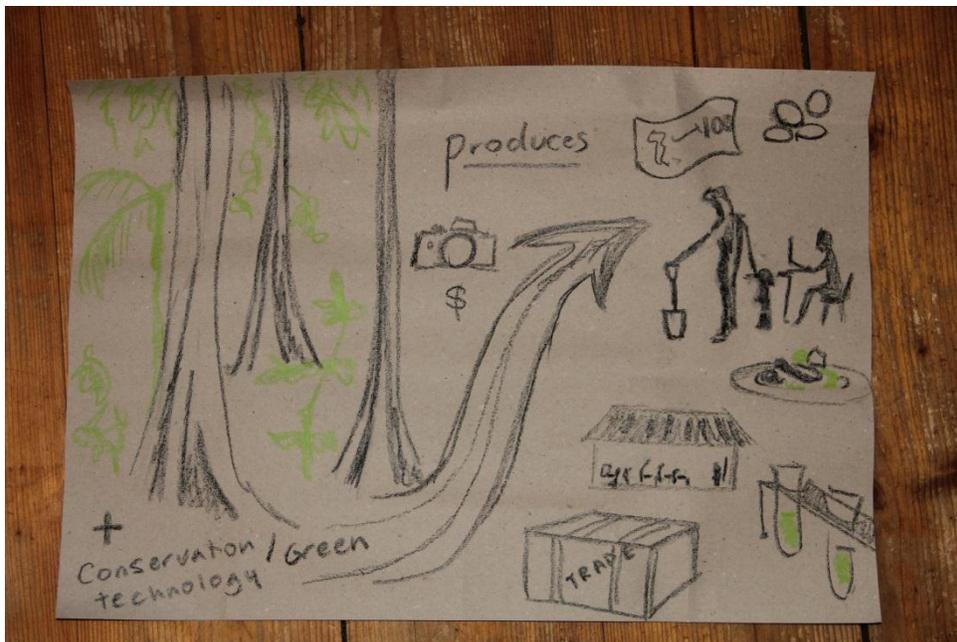


Figure 13. Example of an image drawn by artist during afternoon session of workshop illustrating the sustainable solutions discussed within the context of the *Sustainability First* scenario.

## II.4. Policy robustness and comparison

As indicated in Section 2, the final part of the methodology was not executed during the workshop. Results on the analysis of policy robustness and comparison across scenarios were generated *a posteriori*, based on an analysis by AMAZALERT project members. Because it yielded important additional insights and because it was based on the results as generated during the workshops, we opted to include the main findings in this report.

### II.4.1 Robust policies

The results are presented in Table 2. Included are seven strategy lines that followed directly from the results presented in Section 3. The following conclusions can be drawn:

- Three strategy lines, international policy agreements; strengthen civil society; and create sustainability criteria for investments, could be considered fully robust as they were discussed in the context of both scenarios. A fourth strategy line, international trade agreements could also be considered potentially robust.
- For most of the strategy lines, further analysis is needed to establish the degree of robustness in terms of underlying objectives, timing, actors involved, and overall approach. The international trade agreements strategy line shows that there might be differences.
- In general, none of the strategy lines except ‘more scientific research’ were evaluated as not robust.

Table 2. Comparison of main strategy lines and evaluation of robustness in the two scenarios. Underlining indicates scenario within which strategy was proposed.

Strategy line	<u>Sustainability First</u>	Security First	Potentially robust?
More scientific research	<u>Yes</u>	No	No
International policy agreements	<u>Yes</u>	Yes	Yes
Sustainability criteria for investments	<u>Yes</u>	Yes	Yes
Strengthen civil society	Yes	<u>Yes</u>	Yes
International trade agreements	Yes	<u>Yes</u>	Yes
Incorporation of cost of harm	Not discussed	<u>Yes</u>	To be determined
Increase strength of EU-level agreements	Not discussed	<u>Yes</u>	To be determined

In short, there is a rather large degree of similarity between the strategies that resulted from the context of two radically different future scenarios. Although more and more detailed analysis is needed to substantiate whether the potential similarities hold when further elaborated, it seems that there are at least elements of a number of strategies that could be successful in both *Sustainability First* and in *Security First*, and particularly related to:

- Working towards new international policy and trade agreements
- Supporting sustainability criteria for (market) investments
- Investing in public awareness raising campaigns

#### II.4.2 Current and future policy needs

A final comparison that was made after the workshop was between the items identified as currently important in the morning session and future strategies in the context of a scenario in the afternoon session. Table 4 compares the results presented in Section 3.1 (current impacts) and Section 3.2 (future actions). It can be concluded that a number of main elements were discussed both to describe the current situation and in the context of a future scenario to actively aim at reducing deforestation, including the need to strengthen civic society, the potential role of international trade and trade agreements, and regional collaboration. Given the fact that the same groups discussed present and future, this is perhaps not unexpected. More interesting, however, is that a number of issues emerged from the discussions that were framed by contextual scenarios and desired endpoints within those, including the need for scientific research and the strategy to incorporate costs.

Table 4. Comparison between issues discussed as currently important in discussing deforestation in the Amazon and future strategies to reduce deforestation.

<b>Current issues</b>	<b>Future strategy</b>	<b>Conclusion</b>
Social cohesion	Strengthen civic society	Continuously discussed
International trade agreements	International trade/policy agreements	Continuously discussed
Standards and norms for trading	Trade agreements	Continuously discussed
Regional collaboration	International agreements;	Continuously discussed
Technical cooperation	-	Less important in scenario discussion
-	Scientific research	Emerged from scenario discussions
-	Strengthen EU	Emerged from scenario discussions
-	Incorporate costs	Emerged from scenario discussions

Besides those mentioned in the table, the example of bilateral collaboration with China as proposed in the context of *Security First* serves to illustrate how new discussions were triggered. It can be concluded that it is potentially beneficial to use multiple methods in a single workshop, as they provide different pieces of the puzzle, in this case ‘current problems’ and ‘future solutions’, that together help identifying key elements of how Europe can contribute to slowing deforestation in Brazil.

Similar to the analysis on robust strategies, however, this is but an initial analysis that only provides hints of what general issues seem most important to further investigate. Other methods would be needed to corroborate these findings, particularly (quantitative) models that can, for example, provide more information on the role of trade.

## **II.4. Discussion**

### **II.4.1 Process**

We aimed at fulfilling a rather large number of objectives in one single-day workshop. We knew up front that this was a challenging undertaking. One day did indeed turn out to be very short for what we planned to do. Because of the animated discussions during the presentations in the morning, time pressure on the actual workshop sessions was very high. The final session in which strategies are compared and the robustness of policies is analysed was ultimately not conducted during the workshop, but by AMAZALERT project members afterwards. For any future cases, we recommend to conduct a two-day workshop to increase time availability.

On the other hand, throughout the day, participation was very active and in both break-out groups there were animated discussions. Lunch was similarly used to continue discussions. Additionally, most participants arrived in time and stayed for the duration of the day. Moreover, there was an active interest in results of AMAZALERT project. Presentations were followed by lively discussions and detailed questions.

### **II.4.2 Results**

A large amount of material was generated. The choice for two break-out groups during all sessions and the choice for mindmapping and backcasting as two central methods yielded a wealth of information. The two scenarios that were selected to shape discussions on future policies gave rise to sets of policies and strategies that were highly complementary. Overall, the different methods yielded results that together provided a complete picture of the current situation, possible future changes, and (robust) strategies to decrease deforestation.

On the downside, almost all actions that were identified remained rather vague. This was partly related to a lack of time and partly to the fact that being concrete on future action within a contextual scenario is difficult. A two-day workshop will increase time available to flesh out the policies and other actions in more detail.

## **II.5. Conclusions**

The workshop was successful in terms of process and outcomes. In general terms, all objectives were met, although the last and synthesising session was completed after the workshop. A (small) list of potentially no-regret policies was obtained, importantly related to strengthening civil society and social cohesion; a better embedding of the EU in international agreements and policies; and investments based on sustainability criteria. Together these might increase the influence of the EU on reducing deforestation in the Amazon.

## **PART III – STAKEHOLDER INTERVIEWS**

### **III.1. Introduction**

The workshops in Brazil and Europe brought together a broad range of stakeholders and perspectives. Yet, a disadvantage of workshops is the fact that people need to be brought together physically in one place. This is particularly problematic in a country as large as Brazil.

Consequently, we decided to also use “interviews” as a means to collect information on issues similar to those discussed in the various workshops with in explicit intention to include also those stakeholders from places that were underrepresented among the workshop participants. Between June and November 2013, 18 interviews were conducted with experts from different backgrounds and specializations, covering most of the States on the Legal Amazon, with the exceptions of Maranhão, Tocantins and Rondônia, as well as representatives from nationwide organizations.

The interviews took approximately 1 hour and explored the following aspects:

- Main factors and activities that lead to deforestation and land use change;
- Challenges and goals for the coming years;
- Impact and influence of external agents
- Key national policies and initiatives of importance in the region;
- Importance of ecosystem services.

The overall result is a rich data base with relevant information about the present situation of the Amazon, the short-term trends (5 to 10 years) and long-term future outlook (40 years), the perspective of the different stakeholders about what in their opinion would be a desirable future for the Amazon, and pathways to achieve this desirable future.

## **III.2. Methods**

### **III.2.1 Stakeholder selection**

We tried to maximise the stakeholders that were identified and interviewed, based on the following criteria:

- Geography. We attempted to interview at least one person from every state within the Legal Amazon.
- Background. We targeted stakeholders from government, NGOs, business, and academia.
- Expertise. We focused on stakeholders with knowledge from the following sectors: agriculture, climate change, land use, forestry, and nature conservation.
- Gender. We aimed to include at least 25% women
- Age. We targeted specifically also more junior stakeholders.

We started with the identification of over 200 relevant institutions, companies, government bodies etc. From those, 25 were selected as primary targets for the interviews. Subsequently, we identified and contacted 25 individuals that agreed to be interviewed. Out of those 25 potential interviewees, 18 were interviewed, partly due to time constraints (see Table 1 for an overview of geographical spread and background; see Annex 2 for additional background information).

### **III.2.2 Interview set-up and execution**

We opted for a semi-structured interview set-up (for the interview questions, see Annex 1), using both features from structured and open-interviews. A series of questions was prepared, in order to obtain a structure in the interview. The questions were chosen and phrased such that the information obtained could be compared to the results of the workshops. Exact formulation was discussed with representatives from the Brazilian partners in AMAZALERT (EMBRAPA and INPE) to ensure that comparable information would be obtained. Because of the huge geographic spread of the interviewees, interviews were conducted by Skype.

The introduction of the interview (introducing myself, explaining why/how/how long the interview will take etc.) complied with the criteria as described in Frey and Oishi (1995). After this introduction, general questions were asked to obtain an idea of the respondent's background. Questions were meant to comfort the respondent, and to establish the personal connection between the respondent and the Amazon forest. The following questions were more focused on the goal of the research. The interviewer attempted to remain neutral the entire time, by asking open questions and by not showing his own opinion. The formulation of the questions was kept simple but accurate (see Frey and Oishi, 1995; Wulms, 2012). All interviews were taped using the software "MP3 skype recorder". The taped version was used to transcribe a summarized version (following Ritchie and Lewis, 2003).

### **III.2.3 Data analysis**

Fourteen questions were asked in a logical sequence, exploring specific issues on the current situation and future outlook. Therefore in order to analyse the data, the questions were divided into 3 groups:

1. Current situation – what are drivers and policies at present?
2. Future outlook - what could happen in short-term and long-term future?
3. Pathways – what could be done to change this?

This also mirrored the main topics addressed in the various workshops.

Table 1. Geographic location and background of the stakeholders interviewed.

<b>N° per Sectors / States</b>	<b>Government</b>	<b>NGOs</b>	<b>Business</b>	<b>Scientist/Academy</b>	<b>Total:</b>
<b>Amazonas (AM)</b>	1	1	-	-	<b>2</b>
<b>Pará (PA)</b>	-	-	1	3	<b>4</b>
<b>Rondônia (RO)</b>	-	-	-	-	<b>0</b>
<b>Roraima (RR)</b>	-	-	-	1	<b>1</b>
<b>Amapá (AP)</b>	1	-	-	-	<b>1</b>
<b>Mato Grosso (MT)</b>	-	2	-	-	<b>2</b>
<b>Acre (AC)</b>	-	-	1	-	<b>1</b>
<b>Tocantins (TO)</b>	-	-	-	-	<b>0</b>
<b>Maranhão (MA)</b>	-	-	-	-	<b>0</b>
<b>Legal Amazon</b>	1	2	3	1	<b>7</b>
<b>Total:</b>	<b>3</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b><u>18</u></b>

### III.3. Results

#### III.3.1 Present situation

##### *III.3.1.1 Main causes of deforestation*

Figure 1 shows a frequency distribution of the main current causes of deforestation as indicated by the stakeholders. An overall consensus shared by the stakeholders was that it is difficult to list the main causes of deforestation within the Amazon as there are multiples pressures and drivers acting simultaneously, varying in intensity from region to region. Yet, most of them started giving their opinion on what they believe is causing deforestation in the region after this first statement. The expansion of the agricultural frontier through livestock farming, associated with logging activities and together with mechanised agriculture were raised as the three main direct causes of deforestation. However, those activities are influenced by several different aspects, which determine the regional importance. Large infrastructure programs (such as opening of roads like BR 319 and BR 163, hydro dams like Belo Monte, PAC, etc.) as well as land tenure issues and the difficulty to have the necessary legal land ownership documents, associated with the fact that there was an introduction of a model in the region based on agriculture, help to shape the importance of the main drivers in different regions. The answers of Fernando Sampaio (executive director of ABIEC), Rogério Cabral (Executive director of NEXCU'S) and Ricardo Abad (ICV Geo tech coordinator), respectively, serve as an example of the consensus shared by respondents on the complexity of the issue to single out a small number of causes of deforestation:

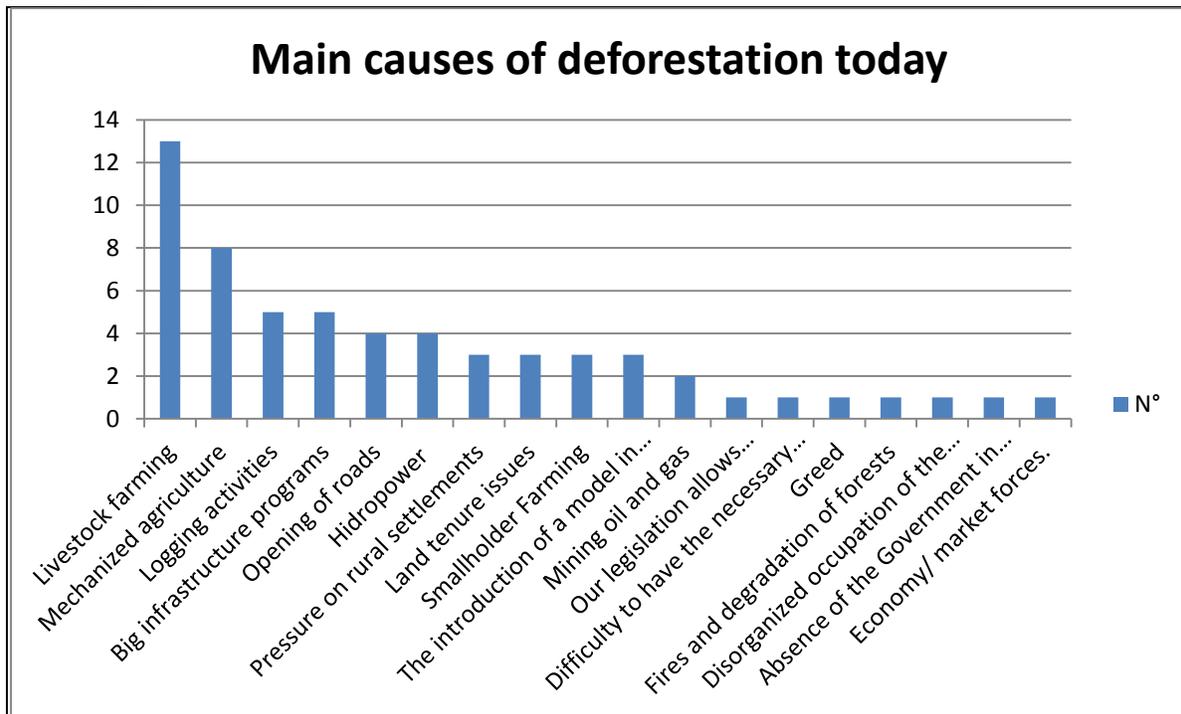
“Many people consider cattle farming as a cause of deforestation, but in fact it is a consequence. If you look at the data, the area occupied with pasture is decreasing in Brazil, today it is possible to increase productivity without increasing the productive area. Our interpretation is as follows. At the border area the first activity that will appear after deforestation is cattle ranching. The error here is to transform this correlation in a cause correlation question. What causes deforestation is the disorganized occupation of land and the absolute absence of the state in protecting public lands. The best way to prove that you are occupying that area is to put cattle there. Sell the wood first and then put the cattle.” (Fernando Sampaio)

“As Amazônia is so big, it may have different causes (...) variables that are most prevalent in a particular region than elsewhere, for example. The opening of roads, like BR 319 that connects Porto Velho to Manaus, is one of the major sources of stress for those who are there in the protected areas of Southern Amazon. Now in Pará the UCs (Conservation Units) suffer more with cattle and mining, but the BR 163 in Santarém is also a source. More recently, hydropower, as a work of infrastructure (...) so the variables are not many but change the profile and strength of each of these threats according to each region. The state of Amazonas has a very strong pressure with the oil and gas. So it is a very characteristic profile, for each region you will find a set of these factors working with a variable more predominant and other less predominant.” (Rogério Cabral)

“There are many causes and they are very dynamic, varying in intensity depending on other issues. At present, for example, we see a decrease of deforestation, especially related to large areas like we had over the last decade. However, an increase of number of fires and degradation of forests, sometimes with less impact like selective logging. The tendency is an intensification of cattle ranching, with soy entering the degraded pasture lands. There have been recent alerts on the increase of deforestation again, but they are not 100% trustworthy, so to be sure we'll have to do a deeper analysis like PRODES.” (Ricardo Abad)

A few other causes were raised with less consensus, such as the pressure on rural settlements, smallholder farming and mining, oil and gas activities. Fires, disorganized occupation of the territory, absence of the Government protecting public lands, economy/ market forces and greed were also commented as important causes.

Figure 1. Frequency distribution of current main causes of deforestation, as expressed by stakeholders.



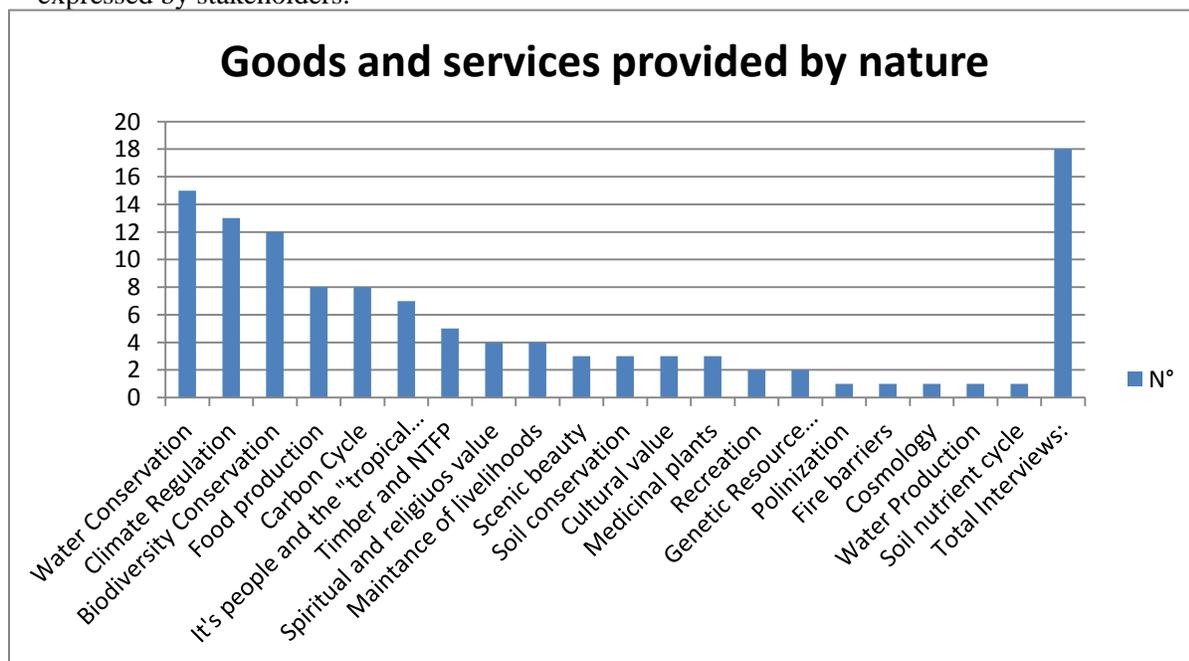
The results are similar to what can be found in literature on the drivers of change in the Amazon. According to various sources (e.g. Martino 2007; Betts et al. 2008; FAO FRA 2010), the main driver of change in the Amazon Basin is land use change through deforestation and large-scale degradation of tropical rain forest. In some countries, the most visible threat is deforestation and forest degradation along the infrastructure projects, through road expansion and large scale agriculture that comes with intensive use of fire (see Barreto et al. 2006; Killeen et al. 2007, 2008; Martino 2007; Jarvis et al. 2009; RAISG 2009; Betts et al. 2008; Müller et al. 2011a, 2011b for the case of the Bolivian Amazon). The literature, therefore, confirms that the drivers identified here for the Brazilian Amazon are very similar to the ones reported to be important in other Amazon countries.

### III.3.1.2 Ecosystem Goods and Services

The next question in the interview was related to the perceived most important ecosystem goods and services provided by Amazon forests. As illustrated in Figure 2, 20 different ecosystem goods and services were mentioned. The most often mentioned (15 out of 18 respondents) ecosystem service was ‘water conservation’. ‘Climate regulation’ and ‘biodiversity conservation’ were mentioned by more than half of the stakeholders as well. Following those three services, ‘food production’, ‘carbon cycle regulation’ and ‘its people and the tropical culture’ were mentioned most often. ‘Timber and Non-Timber Forest Products (NTFP)’, ‘spiritual and religious value’ and ‘maintenance of livelihoods’ were also mentioned at least 4 times, followed by ‘scenic beauty’, ‘soil conservation’, ‘medicinal plants’, ‘recreation’ and ‘genetic resource conservation’ that were all mentioned more than once. Finally, ‘pollenisation service’, ‘fire barriers’, ‘soil nutrient cycle’ and ‘cosmology’ were mentioned once, but were nonetheless regarded as important given the rather low number of interviews.

Comparing these results with the findings reported in Deliverable 1.4 on most important ecosystem services across South America, we conclude that there are large similarities. Deliverable 1.4 lists as most important ecosystem services ‘water supply’, ‘fishing’ (that could be a benefit derived from the protection of biodiversity conservation and water supply and also related to food production), ‘climate regulation’, ‘carbon sequestration’, ‘soil’ (related to agriculture) and the ‘protection of biodiversity’ (including genetic resources), also indicated by Pinell et al, 2012).

Figure 2. Frequency distribution of ecosystem goods and services provided by Amazon forests, as expressed by stakeholders.



### III.3.1.3 Social development and relation with deforestation

We analysed questions 10 and 13 (See Annex 1) together in order to get the full picture of the stakeholders' perception on rural and urban social development trends over the Amazon. Their view over the key ways to achieve this type of development is summarized in Table 2.

Table 2. Frequency distribution of key ways to achieve (social and/or economic) development without deforestation as mentioned by the stakeholders.

Key ways to achieve (social and/or economic) development without deforestation	N°
Stimulate market for forests products that keep the forest standing (Organization of supply chains with a fair remuneration as its base of NTFP and timber production through sustainable management of forests)	8
Development based on the valorisation and production of local knowledge, the solutions coming out from them.	6
Re-evaluate the way we measure development and growth, including quality of life and the services provided by nature (new models of development)	5
Payment for environmental services	3
Higher investments on education.	3
Production intensification on the areas we already have opened today, with the recovery and restoration of degraded lands using them sustainably.	3
Strengthening of "Command and Control" policies.	3
Use and valorisation of Biodiversity.	3
Have better access to basic services, infrastructure and technology in way that is not harmful.	3
Policies that stimulate more diversified production and better practices at the local level, with less social and environmental impact. (Demonstration units helping to spread)	3
Planted forests	1
Development of economic poles in urban centres where people are better linked with the wider network of the economy.	1
Better systems to make sustainable forest management and environmental projects less slow on bureaucracy.	1
Fast Urbanization, so there is less human pressure in the country side.	1
Better definition of land titles rights.	1
Long term planning and the construction of development strategies for the country to establish a new model.	1
Better territorial management	1
Better organization on the transition from rural migration to the urban centres.	1

Political willingness	1
Development of a sustainable aquiculture	1
Strong rural extension agencies, attuned to the new technologies.	1

These results are complemented by answers to the question whether ‘zero deforestation’ is possible given current rural and urban social development trends. The majority of the respondents indicated that it is impossible, mostly because the new Forest Code allows (limited) deforestation, which is therefore assumed to also take place. Additionally, illegal deforestation is pointed out as a large threat, which needs to be combatted. Main issues/solutions to reduce deforestation in general presented by respondents were:

- The strategy the government has adopted so far with PPCDAm (“Command and Control”) has helped, but it is insufficient. Only command and control is not enough to solve the issue of illegal deforestation, as you are not acting on the underlying causes.
- Lack of willingness, with the rural sector being very strongly represented in the Government, even though the market sector is ready for it. It needs to get the market supply chains in order and discuss with their providers to implement expansion without deforestation further.
- Slash and burn culture needs to be better understood, raising public awareness about the negative sides of this practice.
- A strong social movement and sufficient investments by the government in a structure that allows efficient monitoring and control system.
- The government should be more ambitious and have a positive net rate of reforestation as the goal.

#### *III.3.1.4 Political and institutional context*

The below summarises the views of the stakeholders on the current political situation.

There was consensus that over the last decade the political and institutional context within Brazil and the Amazon has strongly improved, although it is also perceived as remaining insufficient. The political willingness to set up strong foundations in order to build a sustainable future for the region is a complicated issue, as it depends on a variety of actors and desires. Although increasing the public is aware of the environmental problems related to land use change and the markets are more demanding regarding sustainable practices, it is still not enough to influence decision making. A good example is the new Forest Code, which during the debate was very controversial and still provokes tension between the different sectors. As a result, even though we have countless successful experiences happening at smaller scales, they are relatively insignificant at broader scale. Or worse, sometimes they have the right scale and are working fine, but when there is a change of the government initiatives are abandoned.

Another important issue raised was the lack of transparency and corruption occurring at all (political) levels, which have been improving but are far from being eradicated. Below, we describe the details of opinions of the stakeholders on how external actors influence land use change and which policies are important at the moment for the region.

#### *Influence of external factors*

By and large, respondents agreed that policies outside of the Amazon have at least an indirect influence on land use change in the Amazon, mostly related to the demand coming from abroad. Some respondents indicated that when there is market demand for agricultural commodities or timber, the influence on deforestation rates. Others argued that the governance system of Brazil is rather independent of these commercial external influences, and that therefore the main factor driving land use change are internal economic activities. Yet, there was broad agreement that the role of the EU and US differs from the role of China. The EU and the US market demand a higher degree of sustainable production, through, for example, information on the source of the product, i.e. related to purchasing products from areas without deforestation only. If Europe would limit wood imports to timber from sustainable areas only, it would stimulate this practice. In this example, the commercial market sector paves the way by setting a good example. The same holds for certification programs that were also mentioned as important tools to help shaping the demand for sustainable products. A good example is the soy moratorium, where the market pressure from Europe, forced companies to implement this agreement.

In contrary, the Chinese market is much less regulated, largely because of the enormous demand for raw materials. Stakeholders agreed that as long as China does not have any regulation to limit import of transgenic soy from Brazil, the producers in Brazil will plant transgenic soy everywhere to meet this strong and growing demand. Arnaldo Carneiro and Willian Assis statements argue in that direction:

Arnaldo Carneiro:

“The supply today of the Chinese soybean market is being done at the expense of the cerrado. Although we will see a small recovery of deforestation rates in the vicinity of major infrastructure projects in the Amazon, as in the Tapajos (bulk ports), I do not believe we will witness new major deforestation due to the market.”

Willian Assis:

“China's interest in mining (iron demand is impressive) is increasingly visible. The demand for soybeans and corn comes from where? Certainly not from the internal market. If you go to the harbour in Belém and you look where the products (timber, meat, iron, soy) are going you will see this influence. It all goes to the first world countries. So even though sometimes the effect is indirect, it clearly helps financing deforestation in Brazil.”

A related interesting point was raised by Edel Moraes (Vice president of the extractive population national council), remembering that the international influence is not only the demand for commodities:

“Most of those large infrastructure projects are also influenced by external actors, with foreign companies constructing the roads or hydro dams, or the hydro dams being constructed to offer energy to foreign mining companies like ALCOA. We are still their colony, with massive exploitation of our natural resources.”

After this open question, we wanted to know with more detail their opinion on four specific topics, which are also related to external influences.

Biofuel policies:

The overall consensus is that the largest risk is over, as the ecological economic zonation for the region does not allow sugarcane and palm oil plantations in the Amazon. Joberto Freitas (Serviço Florestal Brasileiro) agreed to it and stated that “if there is a new policy related to biofuels that it will endanger the forest more than what we have today, will likely have an alert on society to fight against it.” A point raised by Laurent (ICV) which is worth mentioning, is that this type of zonation

is fragile and dynamic: “If suddenly China, U.S and Europe increase the demand for biofuel, it can be a threat for sure.”

#### *Soybean policies:*

Most stakeholders agreed that if there is an increase of the soy demand on the market and prices are high, this will result in an increase of plantations in the Amazon. Once you have demand for a product which offer good financial return that can replace standing forests, this can lead to – legal and illegal – deforestation. Stakeholders clearly indicated that demand from China, for example, will increase which poses a danger to Amazon forests. However, another point shared by most respondents is the fact Brazil has already adopted technologies to increase the production without further deforestation (Like *Plantio direto*, *Integração lavoura pecuária floresta*, production intensification, etc.). Furthermore, international agreements with European countries have been made, with the aforementioned soy moratorium as a good example, mentioned by most of the stakeholders. Below is the view of Gustavo Pinheiro on this issue:

"The production is not coming from previously forested areas anymore. The soybean round table itself in Brazil has started to monitor the purchase of soybeans and the origin of the produce. As a consequence, the large traders no longer buy soy coming from areas which have been deforested. But the challenge is to make sure that the whole supply chain is monitored and checked to ensure the legal origin, and not to look only for soybeans and livestock separately."

#### *Certification programs:*

Most of the respondents agreed that certification programs help to shape the demand of the market based on sustainable practices, which in turn stimulates the producers to aim to achieve the necessary practices. However, stakeholders also agreed that this practice is far from being a sufficient solution. The following remaining issues were identified:

- The certification programs reach only a niche market, which is not enough to have a large impact. The efforts end up only benefiting a few well-organised groups.
- Product traceability is not complete.
- Other internal policies could have a much larger impact.

In this respect, Rogério Cabral’s statement is very interesting, alerting that this practice only work if there is a market sensitivity to pay differently for this product:

“I think certification programs are extremely healthy and useful, but only as long as there is a market awareness to recognise this. You need to have a market sensitivity to pay differently for a product that is certified. Europe has this sensitivity, but China and the internal Brazilian market do not.”

#### *REDD+:*

Answers on this issue varied. Gustavo, Adriana, Bernardo and Laurent were more optimistic about the possible influence of REDD+, arguing that REDD+ holds a large potential to change the land use dynamics, since it would bring a substantial contribution of resources to the environmental agenda. They noted, however, that the program will work only when we have goals agreed internationally. This view is shared by Rogério, Edel and Lana, who are less optimistic. They argue that REDD+ related agreements are not yet strong enough. They argue that there is a large risk of creating a local expectation of a particular community (to receive carbon credits for example), without having created the pre-conditions to ensure this effectively. Somewhat more moderate are the views of Ricardo, Gutemberg and Joaquim, who see the mechanism as positive when it brings a clear return to the society (like payment for one of the environmental services the forests provide). However, they argued that until now the practical implementation mechanisms have not been well defined. Kaline’s answer is an interesting reflection on the implementation mechanisms in different areas of the Amazon.

“In Acre, I do not believe that REDD+ could work because some areas are so isolated that deforestation is not the issue; there are other problems. In the Amazonas state maybe. In any case, for REDD+ to be successful it requires full transparency in communication to the local communities so they understand well what they will have to do when implementing the project. It cannot be done from the top down.”

#### *III.3.1.5 Currently important policies*

A list of 22 policies was mentioned (see Table 3). None of the policies really stand out as much more important than the others. The two most often mentioned policies (5 out of 18 interviews) were the effort to establish an official cadastre (CAR) and the PPCDAM programs, because of their correlation with the recent decrease of the deforestation rates. Another six policies followed including Education towards an agroecological approach; Policies that keep the forest standing and provide income generation (RESEX, PRONAF, PROEXTRATIVISMO...); Payment for environmental services (PES); improved rural technical assistance agencies; the new Forest Code; and the ABC program.

Table 3. Frequency distribution of currently important policies as mentioned by the stakeholders.

<b>Which policies important at the moment</b>	<b>N°</b>
Cadastro Ambiental Rural (CAR)	5
PPCDAM	5
Education towards an agroecological approach	4
Policies that keep the forest standing ( RESEX, PRONAF, PROEXTRATIVISMO...)	3
Payment for Environmental Services (PES)	3
Rural technical assistance agencies	3
The new forest code	3
ABC Program	3
PAS, Sustainable Amazon Plan	2
Policies that organize the supply chain of NTFPs	2
Política Nacional de aquisição de alimentos nas escolas (PNAE)	2
Política de aquisição de alimentos (PAA)	2
Land management for municipalities	2
The public buying based on well-managed forests	1
Municípios Verdes (green municipalities)	1
Policies that stimulate awareness	1
Policies that stimulate local fish production	1
Land title regularization and equal distribution of land	1

Encouraging trade fairs of family farming.	1
Sustainable infrastructure	1
PAC	1
REDD	1

### III.3.2 Future outlook

#### III.3.2.1 Short-term trends (5 – 10 years):

##### *How will currently important policies evolve?*

The analysis of how current policies will evolve was based on the answers provided on the previous question. Responses varied, with different perspectives being put forward. The only view shared by the majority of the stakeholders is that the near future of current policies will depend largely on the political willingness of decision makers, especially with the upcoming elections (which took place in November 2014). The political system suffers from a great instability with policies sometimes being very personal. The view of Lana Oliveira illustrates this argument:

“The tendency is the strengthening of policies, but it depends a lot on the political willingness (...) if the government and the interests change, a lot can be reversed. That is why I believe we need the institutionalisation of concrete policies, like an agenda with a long term commitment (...) because single environmental projects come and go.”

Rogério Cabral agrees with this view and indicated that what he would like to see is continuity and permanence. He argues that worse than not having policies is to keep changing them continuously. Especially when we are talking about Amazon conservation, arguing that the results are never short to medium term. It requires a political continuity.

Below is the summary of the main short-term trends as indicated by the stakeholders:

- A tendency of the situation to remain as it is today.
- A tendency to strengthen the environmental management at municipality level. Yet, this will probably not be institutionalised within the next 10 years.
- A potentially stronger rural technical assistance, because of the recent creation of the new national technical assistance agency.
- More financial resources for environmental/sustainability projects. Yet, when compared to investments in other sectors, the amount invested is almost negligible.
- The rural agricultural credits (for example, the ABC program) are opening space for alternative agricultural practices, such as agroforestry systems and organic agriculture. This can be a great incentive for those practices to spread.
- Policies related to sustainable management of forests are going to be more frequent, strengthening the forest-based economy.
- Education has been improving over the last years, so the tendency is to further improve, or at least an improved access to education.
- The economic crises, still have an impact and could create financial barriers or opportunities driving an increase on deforestation rates over the next years.

*Changes in the socio economical context:*

Here we decided the best approach would be to make a small summary of the perspective of each stakeholder in order to cover all important aspects, as the opinions varied substantially according to their expertises. Table 4 summarises their answers:

Table 4. Summary of individual stakeholder's answers related to most likely short-term (5-10 years) socioeconomic changes.

<b>Stakeholder</b>	<b>Changes in the socioeconomic context (5 – 10 years):</b>
<b>Rogério Cabral</b>	Pressure on urban centres, with an increase of population. Stronger influence of rural populations in the Amazon in public policy (making). This follows current trends initiated by policies such as Bolsa Família and Bolsa Floresta.
<b>Joberto Freitas</b>	Advance of a forest-based economy; clean timber production systems; sustainable long-term forest management; and a more regular supply that impacts the market, allowing an increase of export.
<b>Edwin Keizer</b>	The current political situation is not very good and will not improve: Limited flexibility in environmental laws, poor possibilities of licensing of projects, lack of demarcation of conservation areas. Thus, the short-term outlook is one of possible serious conflicts, especially related to big infrastructure projects taking place at present.
<b>Kaline Rossi</b>	Higher income of the people whose livelihood depends (partly) on forest products. This is already taking place and I believe the trend will continue.
<b>Lana Oliveira</b>	Slow but steady increase of the quality of life of communities living next to and inside the forests.
<b>Edel Moraes</b>	Improved access to education and increase of public awareness and consciousness of the issues around deforestation, agribusiness, extractive populations, indigenous rights etc. (even if it is very slow).
<b>Ricardo Abad</b>	The largest influences on deforestation are the infrastructure projects planned for the region, like roads, hydro dams and industrial parks, which are likely to be executed and increase deforestation.
<b>Mauro Silva</b>	More social pressure and a return of social conflicts that had been slowing down. The PAC will be implemented, so you further conflicts are to be expected. The tendency is a stabilization of deforestation rates because most of it is already gone. Agriculture will either be towards more monocultures or towards a diversified family agriculture system (fruit production, honey, fish, and small livestock farming). In macro-economic terms the regulation of land titles and the removal of farmers for mining purposes will be initiated.
<b>Gutemberg Guerra</b>	The short-term outlook is not good. There will be large negative environmental impacts caused by the high speed of economical exploitation boosted by soy plantations and the construction of big hydro dams in order to supply energy for mining purposes. I see big social environmental conflicts in a near future.
<b>Joaquim Ferreira</b>	Improvement of the monitoring system, which has evolved a lot. But we will continue to follow this command and control policy, which may not be enough.

<b>Willian Assis</b>	The dynamics of agribusiness, both in the cereal production, livestock and biofuel, can cause serious problems. (loss of autonomy of farmers) and mining due to the international demand.
<b>Gustavo Pinheiro</b>	The dynamic of infrastructure will slightly change the axis of development within the Amazon, with the consolidation of the southern Amazon. An integration with Peru and the set of Madeira dams, bringing this “development” process to the south of the Amazon, has already happened. This will have the potential to change the dynamics of the region. Similarly, the axis of deforestation of Tapajós (BR163, Itaetuba ports, hydroelectric complex in the Tapajós) will further deforest. There is potential that the entire northern Mato Grosso becomes agriculture, with the soybeans plantations taking over current pasturelands.
<b>Fernando Sampaio</b>	The recent drop in deforestation has shown that Brazil is taking better care of what it owns. And with the advancement of the Forest Code and CAR, the trend is to improve further.
<b>Arnaldo Carneiro</b>	The livestock industry is using a very large share of the Amazon area. The sector has the power to assign it to other activities, as it is going through an intensification process.
<b>Adriana Ramos</b>	There is a tendency of deforestation to increase again, certainly if the same speech and the same policy approach is continued. Yet, obviously deforestation rates will never be as high as they were.
<b>Bernardo Pires</b>	The opening of roads might lead to an increase of deforestation rates. Population pressure tends to remain the same.
<b>Laurent</b>	A continuation of the trends we observe today. Intensification of production from the Amazon for the global commodity market, with potential impacts on forests. The major infrastructure projects and population flow that comes with it, might result in large impacts on the livelihoods of those in the surrounding regions.
<b>Maristela Ramalho</b>	I do not see much change compared to the situation we have today in Roraima. Over the past five years, livestock ranching has strongly increased and these trends are likely to continue, especially near the city centre of Boa Vista and around small urban centres. Agriculture is increasingly in remote areas, opening new agricultural frontiers.

### III.3.2.2 Long-term outlook (2050)

#### Long-term socioeconomic outlook

We follow the same structure as in the previous section, as it relates to the same question, only with a different time frame (long-term; 40 years from now). Table 5 summarises their answers.

Table 5. Summary of individual stakeholder's answers related to most likely long-term (40 years) socioeconomic changes.

Stakeholder	Changes in the socioeconomic context (2050):
<b>Rogério Cabral</b>	Same tendency as for short-term trends, but with improvements more firmly established. Mining/ oil and gas is the major problem to be dealt with.
<b>Joberto Freitas</b>	I think than by 2050 we may be in a stage that the actual timber production is minimal, but the payment for the existence of the forest will be compulsory. Where there is forest, there will be payment for its services.
<b>Edwin Keizer</b>	If more big infrastructure projects are planned for the region, I think the number of conflicts between the indigenous and local communities with grileiros, big farmers, sawmills and industries (hydropower, oil/gas/mining) will increase.
<b>Kaline Rossi</b>	If we have successfully implemented strong public policies on the valorisation of standing forests, I would say it would slow down migration to the urban centres. So I think besides keeping the forests standing, it would also keep the people inside the forest, with them taking care of it, preserving its services. I believe the land conflicts because of indigenous land demarcation will be solved.
<b>Lana Oliveira</b>	I think rural communities will be able to develop mechanisms to be self-sufficient, without the need of governmental aids like Bolsa Família and Bolsa Floresta).
<b>Edel Moraes</b>	Increasing access to education at all levels, including isolated communities that will need a different kind of approach to education. So it is not an education that will be given to us, but an education we will bring to ourselves, respecting who we are and our way of living.
<b>Ricardo Abad</b>	If the large projects go ahead and there is flexibility on the management of protected areas like is happening today in some Conservation Units because of infrastructure projects, we can expect a huge increase in deforestation.
<b>Mauro Silva</b>	The social resistance of local communities in the region will increase, coupled with a higher consciousness of urban populations on rural issues.
<b>Gutenberg Guerra</b>	The last protests here in Brazil are showing the strengthening of social movements. However it is hard to visualise how far and how much local communities will be able to organise themselves in order to redefine political issues. So I see two possible directions: 1. the implementation of this new model which redefines the relation society has with the environment, and 2. the implementation of authoritarian governments which will continue the last 40 years of mistakes in the Amazon.
<b>Joaquim Ferreira</b>	As the command and control policy is subject to all kinds of political pressure, long-term investments to support and expand the control are difficult to realise.
<b>Willian Assis</b>	Major infrastructure projects will be main determinants of change. All this infrastructure and power generation connects with IRSA, which is for the entire South America. The Amazon region will be interconnected through a multimodal transport system and hydraulic power generation. If only half of what is planned to be implemented in IRSA

	happens, we will witness a tremendous transformation in the region accompanied by a large increase in deforestation.
<b>Gustavo Pinheiro</b>	If the paving of BR 319 and Transamazônica occur, then a process of occupation in the heart of the Amazon will start.
<b>Fernando Sampaio</b>	The lack of long term planning, especially in large projects such as related to hydroelectric power, may hinder the Amazon to achieve a more sustainable future.
<b>Arnaldo Carneiro</b>	We need to work towards social and economic integration of local communities, taking the indigenous and extractive communities out of isolation and link them to clean sustainable markets.
<b>Adriana Ramos</b>	What is expected in terms of growth in mining, oil and gas tends to also bring about a lot of pressure. So if action is not being taken within the next 10 years, I think the worst scenarios predicted for 2050 will materialise.
<b>Bernardo Pires</b>	The big trend is that the next agricultural frontier will be over abandoned land and degraded areas previously occupied by livestock. This is around 60 to 90 million ha, equivalent to the entire agricultural area of the country.
<b>Laurent Micol</b>	We will face the need for a much greater integration in terms of infrastructure. Now this may be aimed at conservation, better use of forests or as a trend of continued degradation. Today those are the two large scenarios.
<b>Maristela Ramalho</b>	I have no prospect of improvement.

#### *Main causes of deforestation in 2050*

In order to have a comprehensive picture of which main challenges Amazon forests could be facing in 2050, we joined questions 4 and 6 to better analyse the issue.

Figure 3 shows that stakeholders identified three main causes of deforestation within the Amazon in 2050. According to their perspective, large infrastructure projects such as PAC, the Belo Monte Hydro dam and the construction of roads like BR163 and BR319 are the main problems the Amazon will face in 2050. A second driver of high importance is mining, oil and gas industries. The third main problem which could threaten the Amazon forests is a problem the region has faced for centuries, which according to 5 out of 18 respondents will not have been solved by 2050, namely land tenure issues. The remainder 8 drivers that were mentioned, were only brought up by 1-2 stakeholders.

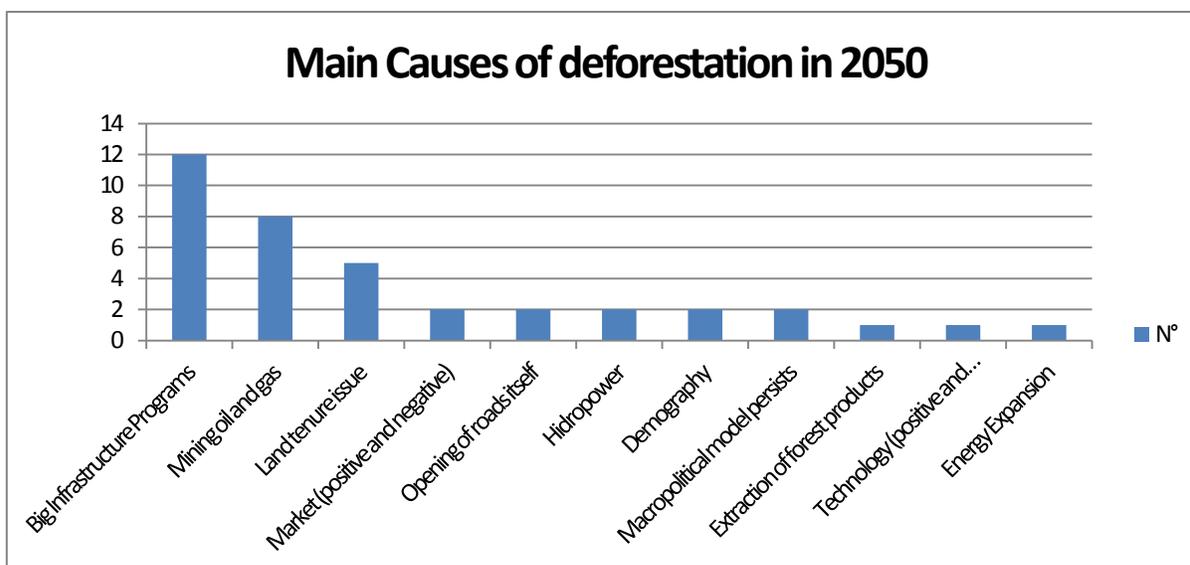


Figure 3. Frequency distribution of main causes of deforestation in 2050, as expressed by stakeholders.

It is interesting to note is that if you compare the current main causes of deforestation (see Figure 1) with those mentioned here, it seems that stakeholders believed that problems related to livestock farming, mechanized agriculture and logging activities (the top 3 of current main causes) will all have been overcome.

### III.3.3 Towards a desirable future: visions and pathways

#### III.3.3.1 Key aspects of a desirable vision

We asked stakeholders to voice their opinion on how their 2050 desirable vision for the Amazon would look like. What are the main characteristics and the key aspects of this vision, and how could it be achieved? Table 6 summarises the stakeholders' opinion on the key aspects of the desirable vision.

Table 6. Frequency distribution of key aspects of desirable vision for 2050, as mentioned by the stakeholders.

Key aspects of desirable vision (2050)	N°
Large investments in education and research at all levels.	7
Solutions for the Amazonian problems being created within the Amazon, with valorisation of local knowledge.	6
Real implementation of all conservation areas, while respecting indigenous territories and traditions.	6
Strong policies related to generating income while keeping the forest standing and restoration and conversion of degraded areas. (PES, Sust. Man. of For., NTFPs)	6

High quality of life with access of poor communities to minimal services facilities.	5
A strong, developed, forest-based economy, with the use of biodiversity, generating income and economic development without deforestation.	5
New development model implemented	2
Large incentives for eco and ethno tourism	2
The livestock chain as a whole assumes the legality, the practice of traceability, transparency, fostering innovation (less extensive, toward intensification)	2
Zero deforestation	2
Strong "Command and Control" policies.	1
Construction of an economic incentive to be applied in the Amazon that values resources before they become scarce.	1
Improved logistics between economic poles within the Amazon, but only after the Conservation Areas are established and protected.	1
Higher political representation on the government with proportional budget	1
Land tenure issues solved and a more equal distribution of the land.	1
Strong local communities, organised in sustainable networks.	1
Social environmental fund established, directed to a group of Amazonian institutions to think about a macro-structuring plan for the region.	1
High-quality rural technical assistance	1
Strong social movements	1
A broad worldwide discussion on the use of natural resources	1
Settlements with economic sustainability, drawn into the socioeconomic dynamics and guided by agroecological practices.	1
Policies to guide a transition from an agricultural to an urbanised economy	1

### *III.3.3.2 Key obstacles to achieve the desirable vision*

In order to achieve this desirable future many obstacles would have to be overcome. Table 7 lists the main obstacles as perceived by the stakeholders. Perhaps not unexpectedly, the main obstacle raised was the lack of political willingness to set up the foundations of a sustainable future for the region. This was followed by the 'lack of planning with a vision' that considers conservation strategies and the fact we need to strengthen MMA structure that takes care of monitoring and enforcement (PPCDAM). Although the table shows numbers of times an obstacle was mentioned during the 18 interviews, the numbers are less important here. What matters more is the (large) total number of different obstacles that were identified and the richness of the description of each one of them, as illustrated in Table 7.

Table 7. Frequency distribution of key obstacles to achieve desirable vision in 2050, as mentioned by the stakeholders.

<b>Obstacles to achieve the desirable vision in 2050</b>	<b>N°</b>
Lack of political willingness	6
Lack of planning with a vision that considers conservation strategies. Government policy decisions are taken with a view to economic and social gain at first and then when the decision is being implemented they will think about the environmental issues.	3
Lack of structure in MMA (that takes care of monitoring and enforcement (PPCDAm)). There is a big gap between what is available and what is really needed in terms of technical instruments and staff to be able to effectively monitor and control the Amazon territory.	3
Existence of legislation that allows deforestation.	2
Poorly enforced environmental laws, recent problems with the demarcation of indigenous territory.	2
Corruption, it is not a matter of lack of resources	2
Lack of education.	2
Lack of legal land security.	2
Agrarian reform policies that sometimes deploy settlements, which end up leading to more deforestation.	1
Illegal timber production is a key aspect. Anything that can be done to reduce the supply of illegal timber, values the standing forest.	1
Lack of participation of local communities in the implementation of those big infrastructure projects.	1
Federal government trying to transfer the responsibility of controlling, monitoring and policy implementations towards the state government, which might increase the conflicts between different states and obstruct the construction of an overall plan for the entire Amazon.	1
Market demand for agricultural commodities that puts pressure on the forest areas to be converted into a different land cover.	1
The new Forest Code that changes the size of the legal reserve and can have a big negative impact not only on the forests, but also on some services like water and soil conservation for example.	1
A strong lobby inside the government that is favouring the classical economic development with less social and environmental interests.	1
The global economic system, translated into the agribusiness practices and greed of the world, with the continuation of Amazon and Brazil as a colony of the developed countries.	1
Science as it is done today, reinforcing this model of society, most of the times not connected to reality.	1
As long as the farmers are not placed at the heart of the process, building the policies and scientific validation together with the scientists and the decision makers on a horizontal approach, will never result in fundamental changes.	1

The dominance of the model implemented after the green revolution, with high production specialisation. This ends up simplifying what cannot be simplified, which is agriculture in the tropics.	1
The dominant paradigm placing ourselves as superior and separated from the rest of the environment.	1
High demographic pressure (Amazonas and Pará)	1
Large-scale migrations coming from the northeast, as a result of droughts.	1
Lack of quality and availability of technical assistance	1
Lack of capacity of local communities to organise themselves to achieve a common goal.	1
Government's inability to articulate a dialogue between different sectors, particularly within the Amazon.	1
Weak credit lines for people living in the forests (riparian, maroon, traditional communities), inhibiting possibilities to invest in sustainable management of forests (Timber and NTFPs).	1
Small farmers having difficulty entering the market.	1
Regulatory hurdle is too high. The laws need to be reformed, simplified and become less bureaucratic for this transition to happen more easily.	1
Lack of Spatial planning	1
Lack of CAR being effectively implemented, helping to solve the land tenure issues, demarcation of indigenous lands, Conservation Units, and eco-economic zoning.	1
Lack of environmental governance.	1
Shortage of funding for technological development	1
Lack of policies valuing the local culture	1

### III.3.3.3 Which policies should be implemented to achieve the desirable vision?

After analysing the key aspects for a desirable vision for the Amazon in 2050 and associated obstacles that would need to be overcome, we wanted to know their opinion on which concrete local, national and international policies and other actions should be implemented to help achieving the vision. Table 8-10 list those multi-scale policies.

Table 8. Frequency distribution of local policies and other actions needed to achieve the desirable vision, as mentioned by the stakeholders.

LOCAL LEVEL	
Which policies can be taken to achieve the goals	N°
Municípios Verdes (Strengthening of environmental sector management at municipal level)	4
Infrastructure and technology adapted to the Amazonian way of living	3
Rural technical assistance which take into account the diversity of realities for each region	3
Payment for environmental services extended to other services than carbon (water, biodiversity, etc.)	2
Higher investments on education	2
Map all the successful experiences happening at the local scale, building regional references and opportunities for economic inclusion of smallholders	2
Municipal spatial planning	2
Support of the state government to local associations that help to organise themselves to market production, to add more value to their product, benefiting and selling them for higher prices.	1
Local solutions that increase the purchasing power of the families using the forest. What they get should be enough to lead a decent life.	1
The timber demand of municipal and state governments satisfied only by wood from well managed forests	1
ILPF	1
Stimulate community sustainable management of forests, both for timber and NTFP.	1
Rural education under the perspective of an agroecological approach.	1

Table 9. Frequency distribution of national policies needed to achieve the desirable vision, as mentioned by the stakeholders.

NATIONAL LEVEL	
Which policies can be taken to achieve the goals	N°
Credit lines to prioritise more balanced production systems and promoting innovation.	4
National program on payment for environmental and ecosystem services.	3
Higher investments in education	2
Land title regulations and equal distribution of land.	2
The new Forest Code with the CAR initiatives	2
Política Nacional de aquisição de alimentos nas escolas (PNAE)	2
Política de aquisição de alimentos (PAA)	2
Strengthening of "Command and Control" policies. (PPCDAm)	2
Agroecological National Policy	1
National policies that strengthen the local levels	1
The timber demand of federal governments satisfied only by wood from well managed forests	1
Soy moratorium	1
PAS, Sustainable Amazon Plan	1
Investments in education and research directed to a new model, more intensive in labour work and use of local resources than on capital investments. Reduce farmers' dependency on external inputs.	1
Strengthening of short circuits, which help better planning of production at national and international levels.	1
ICMS Verde	1
Accountability in the implementation of infrastructure projects, making proper licensing.	1
ABC Program	1

Table 10. Frequency distribution of international policies needed to achieve the desirable vision, as mentioned by the stakeholders.

<b>INTERNATIONAL LEVEL</b>	
<b>Which policies can be taken to achieve the goals</b>	<b>N°</b>
Certification programs helping to shape the demand of the market based on sustainable practices.	7
REDD+ can be important, but only when the goals are agreed internationally	5
Higher investments in education	4
It will work unless it (also) comes from inside Brazil. Strengthen national-international collaborations.	4
Effective commitment to reduce emissions internationally agreed, which actually forces countries to act accordingly.	3
Increase commitment from countries, with Brazil playing a leading role on the international forums.	1
Financially support certain projects (Fundo Amazônia, FNMA, etc.)	1

### **III.4. Summary and analysis**

Given the large amount of information, this section summarises the main findings reported in Section 3, slightly changing the order to facilitate analysis and synthesis.

#### **III.4.1 Main causes of deforestation today (count)**

Livestock farming (13)  
Mechanised agriculture (8)  
Logging activities (5)  
Infrastructure programmes + opening of roads (5+4)  
Hydropower (4)

There is agreement that causes are many and very different. Livestock, mechanised agriculture and associated logging are the three main causes. Underlying causes related to land tenure were also pointed out.

#### **III.4.2 Main causes of deforestation in 2050 (count)**

Infrastructure programmes + opening roads (12 +2)  
Mining oil and gas (8)  
Land tenure issues (5)  
Markets (2)  
Hydropower (2)

None of the top 3 mentioned as important today reoccurs in this list. Apparently, livestock farming, agriculture, and logging will have been solved. Remarkable is the importance given to mining issues and land tenure issues.

#### **III.4.3 Main ecosystem good and services (count)**

Water conservation (15)  
Climate regulation (13)  
Biodiversity Conservation (12)  
Food production (8)  
Carbon Cycle (8)

A large number of different ecosystem services (20) were mentioned. Water conservation, climate regulation, and biodiversity conservation stand out at the top 3, but a large additional range was recognised of also having importance.

#### **III.4.4 How to achieve social development without deforestation? (count)**

Stimulate market for forests products (8)  
Stimulate and value local knowledge (6)  
New models of development (5)  
Payment for Ecosystem Services (3)  
Investment in education (3)  
Strengthen Command and Control policies (3)  
Land use intensification (3)  
Policies that aim at diversification (3)

Importantly, the majority of stakeholders thinks that zero deforestation is impossible, particularly before 2020. Fighting illegal deforestation will be difficult. Crucial are that Command and Control is not enough and that willingness is often lacking. Efforts need to include the entire market supply chain.

The answers provided here can be considered as elements of a utopian scenario resembling “Scenario A” as used in the Brazilian workshops and “SSP1” of the most recent set of global socioeconomic scenarios.

### III.4.5 External factors

Demand: The overall answers on this issue pretty much agree that policies outside of the Amazon have at least an indirect influence on land use change in the Amazon, based on the demand coming from outside. Largest influence from China.

Biofuel: largest risk is over due to zonation regulations for sugarcane and oil palm.

Soy bean policies: Agreement that an increase in demand will eventually lead to deforestation.

Certification programs: Agreement that certification programs help to regulate the demand of the market based on sustainable practices.

REDD+ policies: Mixed opinions – all agree that it will only work when internationally coordinated and agreed. Effect on deforestation is unclear.

### III.4.6 Currently important policies

Cadastre (CAS) (5)

Command and control (PPCDAm) (5)

Education (4)

Policies that “keep the forest standing” (RESEX, PRONAF, PROEXTRATIVISMO) (3)

Payment for Ecosystem Services (PES) (3)

Forest Code (3)

Low-carbon agriculture (ABC plan) (3)

The total list of policies includes 22 categories, from a range of different ministries. There seems agreement that the land titling/tenure and Command and Control are the top 2 important policies.

### III.4.7 Short-term outlook

Situation will remain the same

Strengthen role of municipalities

Investments increase but still low

More sustainable policies

Education improves

Overall: a positive short-term outlook

### III.4.8 Changes socio-economic context (short-term and long-term):

The individual answers provided were matched to the five global Shared Socioeconomic Pathways, to analyse the type of future that is being imagined by the respondents (see Table 11). Annex 3 provides a short summary of the five SSPs.

Table 11. Shared Socioeconomic Pathways associated with the short-term and long-term future outlooks as provided by stakeholders.

SSP	Short-term	Long-term
SSP1	4	7
SSP2	6	4
SSP3	6	0
SSP4	0	1
SSP5	2	2
SSP3/5	0	4

Short-term: The majority of the stakeholders viewed the short-term outlook as similar to today (SSP2) with some tendencies of increasing deforestation (SSP3 or SSP5). A significant minority expected improvements (SSP1), also in the short run.

Long-term: The majority of the stakeholders saw either rather positive long-term developments (SSP1 - 39%) or economically driven developments that might lead to deforestation (SSP3/5 - 22%). Remarkable is that none of the participants sketched out a future of doom and gloom (SSP3). About 1/3 of the participants had a similar short-term and long-term view. Most common changes between short-term and long-term related to a more positive long-term outlook:

SSP3 → SSP1

SSP2 → SSP1

Remarkably, one stakeholder was worried about the lack of long-term planning and portrayed a more sunny short-term future.

#### **III.4.9 Key aspects of a desirable vision (count)**

Education: Largest investments (7)

Local solutions: valorisation of local knowledge (6)

Implement CU (6)

Policies: strengthen those that “keep the forest standing” (6)

Increase quality of life (5)

Economic development without deforestation (5)

There was a broad consensus that many different aspects are top priority. The most mentioned aspects include social (quality of life; education), economic (new model), environmental (protected areas), and political (strengthen policies) desires.

#### **III.4.10 Key obstacles (count)**

Lack of political will (6)

Lack of long-term planning (3)

Lack of resources for MMA to execute PPCDAm (3)

Lack of legislation that prevents deforestation (2)

Corruption (2)

Lack of education (2)

Lack of legal land security (2)

Obstacles include a long list of “lack of”, related to political will, planning, resources, education etc., coupled with corruption and low security. Note that these are mostly current obstacles.

#### **III.4.11 Key policies to achieve vision:**

LOCAL:

Municipios Verdes (4)

Technology adapted to Amazonian way of living (3)

Rural technical assistance (2)

PES (2)

Investments in education (2)

NATIONAL:

New credit lines (4)

PES national program (3)

Investments in education (2)  
Land titling regulations (2)  
Forest Code updated to include CAR (2)  
PNAE (2)  
PPCDAm (2)

**INTERNATIONAL:**

Certification programs to shape demand (7)  
REDD+ (when internationally agreed) (5)  
Investment in education (4)  
Emission reductions (3)

A long list of policies and other actions was mentioned, particularly at national level. Crucial at local level was the Municipios Verdes policy. At national level a long list of policies seem to all be necessary. Internationally, particularly the need for collaboration was stressed. Interestingly, two types of policies were mentioned across levels: Payment for Ecosystem services and investment in education.

## **III.5. Conclusions and recommendations**

### **III.5.1 Current situation**

Policies: There is a range of policies that are currently in place to control deforestation. Importantly, the cadastre to arrange land titling should reduce illegal activities; PPCDAm is the command and control mechanism; Payment for Ecosystem Services and other policies aim to “keep the forest standing”. The Forest Code conserves; the ABC plan aims at new agricultural practices.

Drivers: Livestock farming and mechanised agriculture in combination with logging activities drive deforestation. Additional important factors are big infrastructure programmes, including hydropower and general opening of roads.

In short, there are many different drivers that pose a threat to the Amazon rainforests, yet there are many policies that together currently seem to have slowed deforestation.

### **III.5.2 Future outlook**

#### *2020-2025*

The situation will be largely the same, but with a stronger role for the municipalities, more sustainable policies, and improved education. By and large, a rather positive short-term outlook with a rather low deforestation rate.

#### *2050*

Drivers: Infrastructure programmes remain a threat to the Amazon, together with mining activities, land tenure issues, and market demands. Agricultural pressure as well as pressure from logging are not among the pressures.

Positive outlook (cf. Scenario A and SSP1): Low timber production, PES is an important instrument, increase in education levels with high levels of consciousness on social and environmental issues. Shift to use degraded areas rather than forests for agricultural production.

Negative outlook (cf. Scenario C and SSP3): Infrastructural programs continue with opening of the heart of the Amazon, accompanied by conflicts between indigenous people, large farmers, and other industries. A lack of long-term planning will be the main factor. Mining will be a main driver. This results in a large increase in deforestation.

Obstacles 2050: lack of political will, a lack of long-term planning, lack of resources, and lack of legislation.

In short, part of the current drivers, importantly those related to agricultural production, will be successfully combated. This could lead to a sustainable future. Yet, drivers related to hydropower and mining and accompanying infrastructure could become more important which in combination with a lack of resources and long-term planning could lead to the return of high deforestation rates.

#### *Desires and visions for 2050*

Socioeconomic development could be achieved without deforestation by: Stimulating sustainable markets, stimulating local knowledge, put a new model of development into place, and by investing in education.

Other elements of a desirable vision include social (quality of life; education), economic (new model), environmental (protected areas), and political (strengthen policies) desires.

### III.5.3 Conclusions

In short, there are a large number of actions, strategies and policies that need to be implemented and enforced to achieve a vision (that resembles SSP1). The top five of issues that need to be addressed are:

1. **Education.** The need for targeted policies to increase levels of education are consistently mentioned.
2. **Value standing forests.** The need for policies that stimulate ways to provide value to the standing forests has been put forward by many. There are multiple strategies importantly including PES.
3. **New model of development.** A sustainable way of living can only be achieved if the current economic growth model is abandoned and replaced by one that values social and environmental capital.
4. **Environmental protection policies.** A range of current policies needs to be maintained and enforced, including protecting Conservation Units, PPCDAm, and the Forest Code.
5. **Local knowledge.** The diversity of situations and drivers on the ground needs to be combated at the local level, by increasing local knowledge, providing rural technical assistance, and Municipios Verdes.

### III.5.3 Recommendations for future research

The Brazilian Amazon covers a huge area and each region has a very characteristic profile. With only 18 interviews we could not analyse the data in a way that those geographical differences could be explored in full detail. Similarly, it was not possible to flesh out differences between sectors, background, expertise, gender, or age. A larger number of interviews could yield more of these insights and open the possibility for a statistical analysis. On the other hand, the interviews did yield a wealth of information on the current situation, short-term and long-term outlooks, as well as many concrete suggestions of how a desirable future could be reached given that context. We, therefore, recommend to:

- Continue including interviews as part of a participatory methodology, particularly in countries as large as Brazil. This is the only feasible method to gain insights on stakeholder perceptions of regional variability.
- Enlarge the number of interviews in order to enable a proper statistical analysis and comparison across sectors, background and other relevant variables.
- Fine-tune methods used in workshops and interviews to increase comparability.

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### III.7. Annexes

#### III.7.1 Annex 1. Original interview questions

Questions:

1. What is the key focus of your organization?
  - a) What are your main tasks and responsibilities in your current role?
  - b) Which aspects of your current role relate directly to deforestation/ land use change in the Amazon?
2. In your opinion what are the main drivers of deforestation in the Amazon today?
3. Do you think this will have changed in 2050?
4. We have made a list of key themes of drivers, would you rank these according to their relevance in the present. I will give you time to write them down. Here are the categories:
  - a) Infrastructure
  - b) Cattle
  - c) Agriculture
  - d) Land pressure and tenure issues
  - e) Economic/ market forces
  - f) Technology
  - g) Demography
  - h) Extraction of forests products both legally and illegally
  - i) Cultural aspects
  - j) Mining/ Oil and Gas
5. Do you want to add anything about how this ranking will change in 2050?
6. Do you think regions outside of the Amazon, like Europe, USA and China have a big influence on land use change there?
  - a) Can you give some examples of how the policies of these countries influence on deforestation? ( **Check if they covered: Biofuel , Certification Programs and REDD**)
7. What are the goods and services provided locally and globally by the Amazon forests? Please list them.
8. Is it possible to keep economic and social development growth in the region without further deforestation?
  - a) Why is that?
  - b) Do you have any specific strategies or policies in mind? ( **Skip if already answered**)
9. What do you think will be the most significant change in the socio-economic context of the Brazilian Amazon and how will this impact on deforestation?
  - a) In the immediate future ( 5 – 10 years)
  - b) Between now and 2050

10. What are the key aspects of a desirable vision of the Amazon in 2050? Please list and rank them.
11. Do you see the Zero deforestation goal until 2020 as a feasible action of the Brazilian government? (**Skip if already answered**)
12. What obstacles do you envision to achieving these goals? (E.g. poor institutions, corruption, lack of education...)
13. Which policies and actions can be taken to achieve these goals?
  - a) Locally
  - b) Nationally
  - c) Internationally
14. Which public policies are important at present for the Amazon?
  - a) How do you see them evolving over the next 5 – 10 years?
15. What is the role of your organization in those actions?

### III.7.2 Annex 2. Details of stakeholders interviewed.

Name	Job position	Organization	Range	Sector	Data Interview
Rogério Cabral	Diretor executivo	Núcleo de Excelência em Unidades de Conservação (NEXUC'S)	Brazil	Business/ Produtores	08/04/2013
Kaline Rossi	Gerência	Complexo Industrial Florestal Xapuri S.A	Acre (AC)	Business/ Produtores	10/07/2013
Edel Moraes	Vice presidente	Conselho Nacional das Populações Extrativistas (CNA)	Brazil, sede na Ilha do Marajó, Pará (PA)	Business/ Produtores	11/07/2013
Fernando Sampaio	Diretor executivo	Associação Brasileira de Exportadores de Carne (ABIEC)	Brazil, sede em São Paulo (SP)	Business/ Produtores	06/09/2013
Bernardo Pires	Gerente de sustentabilidade	Associação Brasileira das Indústrias de Óleos Vegetais (ABIOVE)	Brazil, sede em Brasília (DF)	Business/ Produtores	18/09/2013
Joberto Freitas	Diretor executivo	Serviço Florestal Brasileiro	Todo Brasil, sede em Brasília (DF)	Government	19/04/2013
Lana Oliveira	Núcleo de Serviços Ambientais	Instituto Estadual de Florestas	Amapá (AP)	Government	10/07/2013
Arnaldo Carneiro Filho	Pesquisador	Instituto Nacional de Pesquisas da Amazônia (INPA)	Amazônia, sede em Manaus (AM)	Government	06/09/2013
Edwin Keizer	Investigação Geoambiental	Greenpeace Brazil	Manaus (AM)	NGOs	03/07/2013
Ricardo Abad	Coordenador do Laboratório de GEO Tecnologia	Instituto Centro de Vida (ICV)	Mainly Mato Grosso (MT)	NGOs	11/07/2013
Gustavo Pinheiro	Coordenador de Infraestrutura Inteligente Brasil	The Nature Conservancy (TNC)	Brazil, sede em Brasília (DF)	NGOs	04/09/2013
Adriana Ramos	Secretária Executiva Adjunta	Instituto Sócio Ambiental (ISA).	Brasília, (DF). Além de (PA,RR, SP, MT, AM)	NGOs	16/09/2013
Laurent Micol	-	Instituto Centro de Vida (ICV)	Cuiabá, Mato Grosso (MT)	NGOs	20/09/2013.
Mauro Silva	Professor do Núcleo de Ciências Agrárias e Desenvolvimento Rural	Universidade Federal do Pará (UFPA)	Pará (PA)	Science	12/07/2013
Gutemberg Guerra	Professor do grupo de pesquisas em Altos Estudos Amazônicos	Universidade Federal do Pará (UFPA)	Pará (PA)	Science	15/07/2013
Willian Assis	Professor do Núcleo de Ciências Agrárias e Desenvolvimento Rural	Universidade Federal do Pará (UFPA)	Pará (PA)	Science	16/07/2013
Joaquim Ferreira	Professor do grupo de pesquisas em Economia aplicada	Universidade de São Paulo (USP)	São Paulo (SP)	Science	26/07/2013
Maristela Ramalho	Pesquisadora de Sensoriamento Remoto e Monitoramento Ambiental	Embrapa Roraima	Roraima (RR)	Science	31/10/2013

### **III.7.3 Annex 3. Summary of Shared Socioeconomic Pathways (SSPs) global and for Latin America.**

#### **SSP1: Sustainability – The Green Road**

This is a world making relatively good progress towards sustainability, with sustained efforts to achieve development goals, while reducing resource intensity and fossil fuel dependency. Elements that contribute to this are a rapid development of low-income countries, a reduction of inequality (globally and within economies), rapid technology development, and a high level of awareness regarding environmental degradation. Rapid economic growth in low-income countries reduces the number of people below the poverty line. The world is characterized by an open, globalized economy, with relatively rapid technological change directed toward environmentally friendly processes, including clean energy technologies and yield-enhancing technologies for land. Consumption is oriented towards low material growth and energy intensity, with a relatively low level of consumption of animal products. Investments in high levels of education coincide with low population growth. Concurrently, governance and institutions facilitate achieving development goals and problem solving. The Millennium Development Goals are achieved within the next decade or two, resulting in educated populations with access to safe water, improved sanitation and medical care. Other factors that reduce vulnerability to climate and other global changes include, for example, the successful implementation of stringent policies to control air pollutants and rapid shifts toward universal access to clean and modern energy in the developing world.

#### *SSP1 Latin America - Latin Green*

It will be challenging to construct an exploratory story that will lead to a totally sustainable region within the next 40 years. One possibility would be to assume that all of Brazil's efforts to strongly reduce deforestation are successful. That this leads to a strong improvement of Brazil's position in the international markets, which in turn boosts the economy. Strongly increasing demand for sustainable products stimulates R&D of green technologies. The enormous success of Brazil quickly leads to implementation of similar policies throughout the region, with countries such as Mexico but also Bolivia leading the way.

#### **SSP2: Middle of the Road**

In this world, trends typical of recent decades continue, with some progress towards achieving development goals, reductions in resource and energy intensity at historic rates, and slowly decreasing fossil fuel dependency. Development of low-income countries proceeds unevenly, with some countries making relatively good progress while others are left behind. Most economies are politically stable with partially functioning and globally connected markets. A limited number of comparatively weak global institutions exist. Per-capita income levels grow at a medium pace on the global average, with slowly converging income levels between developing and industrialized countries. Intra-regional income distributions improve slightly with increasing national income, but disparities remain high in some regions. Educational investments are not high enough to rapidly slow population growth, particularly in low-income countries. Achievement of the Millennium Development Goals is delayed by several decades, leaving populations without access to safe water, improved sanitation, medical care. Similarly, there is only intermediate success in addressing air pollution or improving energy access for the poor as well as other factors that reduce vulnerability to climate and other global changes.

#### *SSP2 Latin America:*

We do not further develop SSP2 as qualitative scenario for Latin America. Note that for quantitative purposes, SSP2 might be considered as a baseline/reference scenario, but this need could also be met by SSP4 or SSP5.

### **SSP 3: Regional Rivalry – A Rocky Road**

The world is separated into regions characterized by extreme poverty, pockets of moderate wealth and a bulk of countries that struggle to maintain living standards for a strongly growing population. Regional blocks of countries have re-emerged with little coordination between them. This is a world failing to achieve global development goals, and with little progress in reducing resource intensity, fossil fuel dependency, or addressing local environmental concerns such as air pollution. Countries focus on achieving energy and food security goals within their own region. The world has deglobalized, and international trade, including energy resource and agricultural markets, is severely restricted. Little international cooperation and low investments in technology development and education slow down economic growth in high-, middle-, and low-income regions. Population growth in this scenario is high as a result of the education and economic trends. Growth in urban areas in low-income countries is often in unplanned settlements. Unmitigated emissions are relatively high, driven by high population growth, use of local energy resources and slow technological change in the energy sector. Governance and institutions show weakness and a lack of cooperation and consensus; effective leadership and capacities for problem solving are lacking. Investments in human capital are low and inequality is high. A regionalized world leads to reduced trade flows, and institutional development is unfavourable, leaving large numbers of people vulnerable to climate change and many parts of the world with low adaptive capacity. Policies are oriented towards security, including barriers to trade.

#### *SSP3 Latin America – Fortress not forest:*

There are many ways to kick-start a downward spiral of protectionism, deglobalisation, inward-looking and environment-ignoring attitudes. It seems plausible that it starts with trade barriers, collapse of (agricultural) export, unemployment and poverty. Note that in terms of deforestation and environmental degradation, this might not be necessarily bad. Ceasing demand for beef, timber, feed (soya), and milk from Europe, Asia and the US might have positive consequences, at least in the short run. The outside forces are combined with internal issues, bringing back memories from a not so distant past. Dictators, corruption, guerrilla warfare and violence all (re)appear in more and more countries. As international (monetary) aid dwindles, the situation worsens quickly. This scenario offers many possibilities for tipping points in social and economic systems towards a dark future that cannot be easily escaped from. However, SSP3 perhaps does not offer the rapid land use changes which might trigger environmental tipping points.

### **SSP 4: Inequality – A Road Divided**

This pathway envisions a highly unequal world both within and across countries. A relatively small, rich global elite is responsible for much of the emissions, while a larger, poorer group contributes little to emissions and is vulnerable to impacts of climate change, in industrialized as well as in developing countries. In this world, global energy corporations use investments in R&D as hedging strategy against potential resource scarcity or climate policy, developing (and applying) low-cost alternative technologies. Mitigation challenges are therefore low due to some combination of low reference emissions and/or high latent capacity to mitigate. Governance and globalization are effective for and controlled by the elite, but are ineffective for most of the population. Challenges to adaptation are high due to relatively low income and low human capital among the poorer population, and ineffective institutions.

#### *SSP4 Latin America: Indifferent dictators:*

For this region, SSP4 seems a positive variation of SSP3 in terms of potential climate mitigation, but a negative version in terms of environmental destruction. The elite are somewhat larger, but have little regard for social development, and together with large multinationals continue to extract natural resources from the environment from forestry, agriculture and some alternative energy

sources, with no regard for environmental consequences. There is strong indifference of the elite towards social, human, and natural capital of the non-connected. The trajectory can differ depending on how the storyline is interpreted. In one interpretation the elite have no inherent interest in the environment, instead pursuing global trade opportunities which just happen to include biofuels. Another interpretation is that the elite have some interest in applying REDD-type policies due to their desire to access carbon markets and remain world players, however there is no interest in implementing the additional safeguards for biodiversity and ecosystem services so these policies are not considered.

### **SSP 5: Fossil-fueled Development – Taking the Highway**

This world stresses conventional development oriented toward economic growth as the solution to social and economic problems through the pursuit of enlightened self-interest. The preference for rapid conventional development leads to an energy system dominated by fossil fuels, resulting in high GHG emissions and challenges to mitigation. Lower socio-environmental challenges to adaptation result from attainment of human development goals, robust economic growth, highly engineered infrastructure with redundancy to minimize disruptions from extreme events, and highly managed ecosystems.

#### *SSP5 Latin America – Educated destruction:*

This is perhaps one of the more difficult scenarios to develop for the region. Because of the large recent changes in some of the big countries, it is not easy to interpret the effects of current globalisation forces. The focus on fossil fuels can be related to potential (large) new oil & gas fields, also in the Amazon forest, which can lead to large-scale destruction of the natural forest. Note that this scenario will have many positive effects related to the agricultural sector and land use:

- Cheap energy – boost for mechanisation?
- Cheap fertiliser
- No incentive for biofuels: gradually less land occupied.
- Large demand for beef, soya and other export crops.

There is a fundamental tension in many aspects between economic development stimulating the economy by providing cheap energy at the expense of the environment, while on the other hand social change is towards equity, high education, low crime and corruption etc.

## CONCLUSIONS

It is beyond the scope of this Deliverable to provide a detailed comparison between all products derived from the various methods to engage with stakeholders both in Brazil and in Europe. Here, we will limit ourselves to a set of main findings, when generally analysing all products. What emerged very strongly from the Brazilian workshops is the fact that a discussion on deforestation and land use change cannot be meaningfully conducted without an integrated analysis of all major aspects that influence the problem. What is more, the Brazilian scenarios were chosen such that major importance was given to social development. In the European workshop as well as in the interviews with Brazilians, it likewise became clear that deforestation touched upon a broad array of issues beyond the environmental laws and impacts. Below we provide a short overview of those aspects, following the often used STEEP (social, technological, economic, environmental, political) categories:

### *Social:*

The Brazilian workshops had a strong focus on social development and therefore touched upon many social problems, including rural exodus to peri-urban areas with accompanying violence and poverty; a decrease in demand for manual labour; isolation of INCRA settlements; and weak policies for family planning. It was concluded that the current model might not be capable of promoting sustainability, as long as it seeks solutions focused on market and consumption, treating people out of the market as invisible. Proposed essential solutions included to revitalise cities; a diversification of the local economy; increase capacity for municipalities, and promote local economic activities; and integrate social and environmental policies. These results were supported by the interviews. The European workshop likewise strongly emphasised social issues (and solutions) in Europe and argued for a focus on strengthening civil society and social cohesion.

In short, social development is regarded the cornerstone to reach sustainability, which includes deforestation control, but goes far beyond it.

### *Technological:*

Technology and technological change played a minor role in most of the discussions. From the stakeholder interviews, it was concluded that Brazil has already adopted technologies to increase the production without further deforestation. One issue that was mentioned repeatedly was the lack of proper rural technical assistance (also in the Brazilian Workshops). Yet, most proposed solutions were related to other sectors than agriculture, e.g. distance learning, or more in general “technologies aimed at economic sustainability.

In short, technology and technological progress are seen as important but secondary requirements.

### *Economic:*

Land-use activities, the agricultural sector, mining, and timber together determine a very large part of the total GDP of Brazil. Consequently, land use change and deforestation cannot be discussed without giving major importance to economic issues. In the discussion of the current situation, Brazilian stakeholders discussed the role of agriculture and forestry, besides a number of other sectors. Both from the workshops and the interviews, however, it became clear that stakeholders see the role of these “traditional” sectors as decreasing, to be replaced by energy (hydro dams, mining), tourism, and other industrial activities. When discussing future solutions, the key words were “diversification”, “sustainable”, and “a different model of development”. The latter relates to a new model that abandons the focus on production increase and agricultural expansion, towards a system

in which existing forests and related ecosystem services are valued, though mechanisms such as Payment for Ecosystem Services and an integration with agroforestry systems.

In short, safeguarding economic development is important but should be accomplished through other means and follow a new development model based on valuing ecosystem goods and services.

*Environmental:*

The main focus of all stakeholder engagement activities was on deforestation and forest degradation in the Amazon. As such, environmental issues were at the heart of all discussions. Yet, one of the main objectives was to discuss the socioeconomic context and political solutions. Thus, the actual environmental issues were not touched upon in much detail, other than being the main overall aim. Moreover, this part of AMAZALERT dealt with participatory methods, which are not very well suited to analyse and discuss environmental impacts. The Brazilian workshops did list a number of important environmental issues, including the recently high rates of forest degradation; recent increases in secondary forests; transnational river basins and their lack of governance; and the tendency of extreme events to be increasing.

In short, although environmental issues were at the heart of the discussions, the emphasis was on socioeconomic drivers, scenarios, and visions, coupled with political solutions, as such providing little detail on environmental change. Note that this was intentional and that this issue is very well covered by other parts of AMAZALERT.

*Political:*

Perhaps the most important objectives of all stakeholder engagement activities was to arrive to a list of strategies, policies, and other actions that would need to be implemented or taken in order to reduce deforestation in the Brazilian Amazon. A large variety of local, national, and international policies/policy recommendations were listed as a result of the different stakeholder interactions in Part I, II and III of this document, sometimes building on existing policies, but sometimes suggesting new initiatives. Some examples of recurring policies and actions given below. Note that this list is not exhaustive and serves more to illustrate the richness and variety of the policies that are being recommended:

Local level:

Integrated rural and urban spatial planning

Integration of social and environmental programs at the territorial basis

Examples of policies:

Municipios Verdes

Food Purchase Program: aiming at food security and small farmers.

National level:

Policy recommendations:

Monitoring systems, including new systems

Integrated spatial planning including private and public lands

Cities restructuring, with a proper network of services and education

Large investment planning to avoid boom-and-burst local economy problems.

Examples of policies

PRODES – monitoring system of deforestation

PPCDAm – command and control to fight illegal deforestation

Forest Code – questioned because it might have adverse effects

ABC – Climate-smart agriculture.

International level:

Policy recommendations:

Sustainability criteria for investments

Trade agreements

Examples of policies:

Certification programs (FRS, Soy Round Table, etc.)

REDD+

FLEGT

In short, many more general policy recommendations and more concrete policies across many sectors and multiple jurisdictional levels have been generated. Deliverable 4.2 further elaborates the effects the contrasting scenarios derived from the Brazilian Workshops (Part I) on land use change and deforestation..